

<b>CONTACTOR SUBMITTAL</b>					<b>Date</b> 2/3/11		
PROJECT NAME: <b>San Jacinto Waste Pits</b>							
CONTRACTOR:		<b>USA Environment LP</b>		Subcontract No.		Sub.No <b>10</b>	
To:	John LaPlante	References:	RAWP				
		Drawing/Spec:					
Subject:	Construction Work Plan	Detail/Section:					
		Discipline:					
Response Requested By:				High Priority:	<input checked="" type="checkbox"/>	Low Priority:	<input type="checkbox"/>
Potential Impact:		TCRA		Cost:	<input type="checkbox"/>	Schedule:	<input checked="" type="checkbox"/>
Attached is the CWP with requested changes excluding the Construction Specifications and Construction Drawings.							
Routing:		Date Sent	Date Received	COMMENTS			
		2/2/11					
Reply:		<input type="checkbox"/> Confirms to design concept <input checked="" type="checkbox"/> Confirms to design concept with revisions shown <input type="checkbox"/> Revise and resubmit <input type="checkbox"/> For information only					
Addressee: Sign and return original to:		Approved By: Comments:					
		Name: Construction Specifications and					
		Title: Construction Drawings attached					
Glenn Smalley		Date:					

This submittal has been reviewed for general conformance to design concept only. This review does not relieve the contractor or supplier of full responsibility for adhering to the contract document and satisfactory completion of all work.

By:  Date: 02-04-2011  
Anchor QEA, LLC

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# CONSTRUCTION WORK PLAN

## TIME CRITICAL REMOVAL ACTION

### SAN JACINTO RIVER

### WASTE PITS SUPERFUND SITE

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Submitted To:

McGinnes Industrial Maintenance Corp.  
International Paper Company  
Anchor QEA, LLC

Submitted By:

USA ENVIRONMENT, LP  
10234 Lucore Street  
Houston, Texas 77017



February 3, 2011



## **TIME CRITICAL REMOVAL ACTION SAN JACINTO RIVER WASTE PITS CONSTRUCTION WORK PLAN**

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### **1.0 PROJECT EXECUTION PLAN**

This Construction Work Plan (CWP) has been prepared to provide a description of USA's project approach for the remediation activities for the Time Critical Removal Action (TCRA) at the San Jacinto River Waste Pits Superfund Site (Site). USA Environment, LP (USA) has prepared this CWP using information contained in the project documents, plans & specifications, and supplemental information developed as the project has evolved. USA has taken great effort to structure this project so that multiple tasks can be performed simultaneously, thereby compressing the overall project schedule to the extent practical. USA's plan incorporates practical, safe, quality conscious and cost-effective measures for the successful completion of this project.

The CWP provides guidance for the Project Team during the performance of the field activities. Each area (Eastern Cell, Western Cell and Northwest area) will be discussed in detail. The tasks associated with each area will be broken down to provide guidance for implementation. This break down will include a description of the equipment and manpower needed for each task, the subcontractors required along with their responsibilities, the materials needed and the sequencing of the work. Please note that the CWP is not intended to replace the information contained in the Final Remedial Action Work Plan (RAWP) or Technical Specifications found in Appendix A that have been previously reviewed and approved by USEPA Region VI, but provides additional information regarding the means and methods for implementation. Appendix B contains the final 'For Construction Drawings' for the project. Appendix C contains a schedule for the project implementation. This schedule will be detailed to the extent practical to allow the project efficiency and progress to be tracked.



## 2.0 Pre-Mobilization Activities

As part of the project execution, prior to mobilization, USA has prepared a series of documents that will provide the final guidance for the implementation of the selected remedy. These documents include at a minimum:

1. Site Health and Safety Plan
2. Site Specific Quality Assurance/Quality Control Plan
3. Site Specific Environmental Protection Plan
4. Site Specific Security Plan

Other documents will also be generated for use during project execution, but they primarily are directed at providing timely and accurate execution internally and include subcontractor management plans, procurement schedules, hurricane evacuation and site management plan.

The following paragraphs provide brief descriptions of the major documents identified above as well as their content.

**Health and Safety Plan** – The Site Specific Health and Safety Plan (SHASP) provides the guidance for the Project Team to implement all necessary actions to protect the health and safety of the site workers. Included in the SHASP is the analysis of the site conditions and contaminants to define the exposure pathways. This definition of the site conditions, contaminants and exposure pathways will allow the implementation of the appropriate protective measures (personal protective equipment, monitoring, etc...) to assure a safe work environment. Further attention will be given to physical hazards (heat stress, poisonous plants and animals, slip, trip and fall hazards, work on or adjacent to water, lifting hazards, etc...) that could impact our project team. USA will prepare a Job Safety Analysis (JSA) for each work task. These JSA's are designed to allow the field staff to pre-plan their work and identify potential safety concerns and the corrective actions needed to resolve these safety concerns.

**Quality Assurance/Quality Control Project Plan** – The Site Specific Quality Assurance/ Quality Control Project Plan (QAPP) provides the means of assuring that the project requirements are met. Major work items and materials which are in the QA program include but are not limited to the following:

- a. Inspection of Environmental Controls
- b. Silt fence
- c. Turbidity curtain
- d. Hay Bales (as needed for short term control)
- e. TXDOT Item 432 Riprap
- f. TXDOT Item 247, Grade I
- g. Natural Stone and Processed Concrete Armor Materials
- h. Skaps GT-142 Filter Fabric (or equivalent)
- i. Skaps GT-112 Filter Fabric (or equivalent)





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- j. Skaps GT-116 Filter Fabric (or equivalent)
- k. Survey Control Specifications

Included in this QAPP are the testing methods and frequency for all materials along with the materials specifications. The specific requirements for survey confirmation of materials placement will also be described. All pertinent reporting forms will also be included in the QAPP.

**Environmental Protection Plan** – The Environmental Protection Plan (EPP) provides the means of assuring the protection of the environment from detrimental impacts from site activities. Major components of the EPP will include but are not limited to the following:

- a. Placement of the silt fence
- b. Placement of the turbidity curtain
- c. Re-fueling for both land based and water based equipment
- d. Decontamination facilities and activities

Included in this will be the Site Specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will be included as an appendix to the EPP. All pertinent forms for monitoring and documents the EPP required facilities and actions will be included.

**Site Specific Security Plan** – The Site Specific Security Plan (SSP) provides a description of the means for assuring the security of equipment and facilities during non-working hours. These means will include:

- a. Use of remote electronic and video monitoring
- b. Use of manned security for random inspections

Remote security will be located at two of the three site operational locations (TxDOT ROW/McGinnes Parcel and Administrative Area). Random manned security inspections will occur at all three of the site operational locations.

In addition, final assignment of field staff from USA and subcontractors will be requested along with copies of all training certificates. As necessary, USA will conduct safety training to assure that all assigned staff are current and competent.



## **3.0 Mobilization Activities**

Upon Notice to Proceed, USA will mobilize necessary personnel and equipment to the site. Prior to commencing the work, the Site Health and Safety Officer will conduct a site orientation and tailgate safety meeting for all crewmembers, subcontractors, and any other parties as directed by Anchor QEA, LLC (Anchor). This safety meeting will inform the crew of potential material handling and excavation hazards, and project safety protocols necessary to complete the project in a safe and timely manner. Specific tasks to be performed during the mobilization phase will include:

**One Call** – USA will initiate a one call to identify below grade utilities in the work areas. This one call will be performed before any intrusive activities occur. In addition, USA will coordinate with the Texas Department of Transportation (TxDOT) to identify any utilities in the right of way belonging to TxDOT. This separate call is required since TxDOT does not report through One Call. Currently it is known that TxDOT, at a minimum, has power and video feed for the IH-10 bridge monitoring that runs through the access road area and ExxonMobil Corporation has several deep-seated pipelines that traverse the access road area.

**Establish Survey Control** – Survey control points will be established during the mobilization activities and the locations of all work areas and boundaries will be established. The alignments of all berms and protective elements will be marked for future activities.

**Establish Environmental Protection** - The placement of the identified environmental control measures (silt fence and turbidity curtains) will be performed in a progressive manner concurrent with other mobilization activities. All upland controls (silt fence) will be installed prior to ground disturbance to the extent practical. Some clearing and grubbing will be required for access. The silt fence will be staked and bedded to control the movement of suspended soil particles from the site. The turbidity curtain will be installed around all areas where work is being performed either over or adjacent to the water. This turbidity curtain will be installed such that it is maintained within three feet of the bottom. The specific details for installation and maintenance of the silt fence and turbidity curtain can be found in the EPP. The turbidity curtain will have to be opened and closed periodically to allow barges and other water borne equipment ingress and egress from the work areas. The location of the area(s) specified for ingress and egress will be defined during the field installation of turbidity curtain. In addition to the above activities, USA will maintain dust suppression capabilities throughout the project. Dust suppression will be accomplished using a water truck to wet the access roads and site as appropriate to minimize dust generation. This activity will be performed at all site operational locations. This activity is further discussed in the EPP.

**Establish Environmental Protection of Lease Support Properties** – Lease properties (LaBarge and Borries) will be assessed, as appropriate, to determine if additional environmental protection controls are required and will be addressed accordingly. In addition, the lease areas (may) be sampled for activity specific COCs to create a base line understanding of site conditions.



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Prepare the LaBarge Lease Facility (LaBarge) – Facilities to be included at this location include a portion of the equipment lay-down area and the material storage areas for the barge loading operations. Barge loading will be performed at this location for placement of the cover materials from the water side. In general the tasks associated with this area will include:

- Set up Restroom and Staging Areas;
- Demarcate Laydown Areas;
- Stabilize Soft Areas at the Material Stockpile Area;
- Place Fencing/Signage as appropriate (dependent on final configuration);

Prepare the Wayne Borries Lease Facility (Borries) – Facilities to be included at this location include Office Trailers, Tool Storage, Office Parking and miscellaneous materials storage. In general the tasks associated with this area will include:

- Establish power drop;
- Establish other utilities (telephone service, water service, sewer service, etc...) as needed
- Set up Storage Areas;
- Set up Office Trailers;
- Demarcate Parking Areas;
- Place/Repair Fencing/Signage (dependent on final configuration);

Delivery of Rock Materials – The Armor Cover Materials will be delivered and stockpiled at two (2) different locations depending upon how the material will be placed.

The Armor Cover Materials for Water side placement will be retained at the Gulf Coast Limestone Texas City yard and at the HPP Houston yard and delivered to the La Barge facility on an On-Call basis. As the materials are delivered to the site they will be placed in the Stockpile Area. If differing materials are delivered for placement, the stockpiles will be segregated by materials type. It is expected that this stockpile will not average more than four thousand tons per day.

The Armor Materials for Land side placement will be retained at the Gulf Coast Limestone Texas City yard and at the HPP Houston yard and delivered to the La Barge facility on an On-Call basis. A Surge Stockpile will be constructed on the TxDOT right of way to stage the land side Armor Material on a daily basis. It is expected that the stockpile will not average more than one thousand tons per day.

Construction of Access Roads and Ancillary Facilities – The location of the access roads will be field verified and survey prior to construction. The access road will be cleared and grubbed to remove existing vegetation and to provide a level subgrade. It is assumed from the provided documents that it will not be necessary to either import additional subgrade materials or to amend the subgrade to provide a stable working platform. After the subgrade has been prepared, USA will place Skaps GT-142 filter fabric or equivalent over the width of the road and import TxDOT Item 247, Type 1 road base. The road base will have a minimum thickness of 12 inches and will be tracked in place using dozers.



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The Surge Stockpile, Truck Turnaround Loop, and Equipment Laydown Area will be constructed within the TXDOT Right of Way. After these areas have been cleared and grubbed, select fill will be imported as needed to establish appropriate grade for operations. Skaps GT- 142 non-woven filter fabric or equivalent will be installed above the select fill and covered by TXDOT Item 247, Type 1 road base at these areas. The road base will have a minimum thickness of 12 inches and will be tracked in place using dozers.

In addition, USA will install concrete protection barriers per TxDOT specification along the entire ROW beginning at the fenceline and proceeding to San Jacinto River. The barriers will be placed a minimum of five (5) feet from the existing bridge column caps to protect the columns and overhead instrument cabling. The barriers will be installed to allow stormwater flow between the barriers. Other site preparation activities will include installation of signage on the peninsula, marking trees greater than 8-inch diameter, and establishment of site wide survey controls.

It is anticipated that this task will take 10 to 15 working days to complete and require the following resources.

### Anticipated Personnel, Equipment and Equipment

#### PERSONNEL

- (1) Site Supervisor
- (2) Equipment Operator
- (2) Field Technician

#### EQUIPMENT

- (1) D6MXL Power Angle Tilt Dozer w/Ripper, 140 HP, 6-Way Blade
- (1) CS563E Smooth Drum, 84-Inch Vibratory Base Compactor
- (1) FORD F800 2000 Gallon Pressure Spray Water Truck
- (1) PC300LC-6 KOMATSU 3YD 24'3" Depth, Excavator, 222 HP, 73,568 LB
- (1) 1000 GAL, 6 Lube Fuel Truck
- (1) 580L CASE 14'3" Depth
- (2) Crew Trucks
- (1) Response Trucks
- (1) Office/Break Trailer
- (2) Port-O-Lets
- (1) 14 Foot John Boat

#### MATERIALS

- ~200 Tons of TXDOT 432 Rip Rap (crushed concrete)
- 40 LF of 36-Inch RCP Pipe
- ~2800 Tons of TXDOT Grade I Flex Base (Crushed Concrete)
- ~5,500 Sq. Yds. Of Skaps GT-142 non-woven filter fabric
- TXDOT Guard Rails & Posts or concrete traffic barriers as appropriate
- Silt Fence



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Signage

Note: Equivalent equipment and/or materials may be substituted for items identified above



## 4.0 Cap Construction Activities

### Western Cell Protection

**Western Cell Grading and Shaping** - Prior to the placement of the geo-textiles and rock materials over the western cell (this description includes the central berm which runs north to south and separates the eastern from western cells) USA will strip the woody vegetation from the site and reduce the height of the central berm. The woody vegetation will be visually inspected for contamination or intermixed source materials. Woody vegetation determined not to be impacted will be removed and stockpiled for shipment off-site as construction debris. The root balls and impacted woody vegetation from vegetation will be removed shredded and evenly distributed across the Western Cell for incorporation below the synthetic cap. Grassy vegetation will be grubbed and pushed to the ground then covered with the material resulting from the degrading of the central berm and/or covered with the imported bedding material.

After clearing and grubbing has been completed USA will degrade the central berm over the Western Cell to assist in the establishment of a uniform grade and drainage. (Note: If impacted materials are encountered during the grading and shaping activities, USA will discontinue these activities and consult with the PRPs or their representative to determine the appropriate path forward). After the Western Cell has been cleared and the central berm degraded, USA will import an estimated 1,000 tons of nominal 3/8-inch bedding material. This bedding material will be provided by HPP. The analytical testing for this material is included in the source testing for the Armor Cap materials as identified in QAPP. The actual volume of the bedding material will be dependent upon the final contours of the Western Cell after clearing and grubbing and degrading of the central berm. This bedding material will be used to provide final grading and shaping of the Western Cell.

After the Western Cell has been graded and the granular fill placed, USA will install a 40-mil LLDPE liner over the site (approximately 123,000 sq. ft.). The LLDPE liner will be underlain by Skaps GT-112 (12 oz.) non-woven filter fabric and overlain by Skaps GT-116 (16 oz.) non-woven geotextile. This LLDPE liner and both filter fabrics will be anchored on the eastern, southern and western perimeters in anchor trenches located in the original berms. The northern perimeter will be anchored under the temporary rock berm.

Upon completion of the synthetic cap the Western Cell will be resurveyed to establish the baseline for placement of the Armor Cap materials.

**Placement of Armor Cap Materials** - The placement of the armor cap materials over the site will be performed both from the water side (water depths nominally more than -2 NAVD 88) and from the land side (water depths nominally less than -2 NAVD 88). Each of these activities are different enough to warrant separate discussions. Prior to placement of the armor cap the submerged areas will be resurveyed by the Engineer to confirm the initial contours.



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The armor cap materials to be used for the cover are as follows based upon the revised specifications:

Material	Size Distribution	Quantity (tons)
Armor Cap Material A (1)	100% passing 6" <50% passing 3" <4% passing #200 sieve	9,968 tons
Armor Cap Material A (2)	100% passing 3/8" sieve <50% to >90% passing #4 sieve <10% to >40% passing #10 sieve <4% passing #200 sieve	2,492 tons
Armor Cap Material B/C	100% passing 12" <50% passing 6" <4% passing #200 sieve	12,380 tons
Armor Cap Material C	100% passing 12" <50% passing 6" <4% passing #200 sieve	10,700 tons
Armor Cap Material D	100% passing 18" <50% passing 8" <4% passing #200 sieve	26,300 tons

Armor Cap Materials A (A (1) and A (2)) and B/C will be processed concrete and that Armor Cap Materials C and D will be natural stone.

Armor Cap Materials A1 and A2 will be blended on site during loading and placement to produce a single Armor Cap Material A. The A1 and A2 materials will be blended in a ratio of 4:1 respectively. Typically during loading of the barges or trucks four (4) loader buckets of A1 will be loaded for every one (1) bucket of A2. The materials will then be stirred in the containers. Further blending will occur when the material is either dug from the barge for water placement or dumped from the trucks during land placement.

**Decontamination of Equipment** - Two (2) types of decontamination are planned for the equipment being used at the site depending upon the conditions of use. These two types of decontamination are as follows:

1. Dry Decontamination
2. Wet Decontamination





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In general, the equipment and personnel will be operating on unimpacted materials during all operations except for the shaping and grading of the Western Cell. With the operations being solely on un-impacted materials all equipment decontamination will be visually inspected to assure that the equipment is clean and not tracking mud or rock out of the Western Cell and onto the access road. Cleaning will be accomplished using stiff brooms and shovels as appropriate. Removed materials will be returned to the cell for incorporation under the cap.

During the Western Cell shaping and grading activities site equipment may come into contact with potentially impacted materials in the Western Cell. The equipment will be visually inspected to determine if impacted materials are present during this phase. If possible it will be removed using the dry decontamination procedures. If the materials are determined to be impacted and cannot be removed using the dry decontamination procedures, USA will construct an above grade decon pad on the southern edge of the Western Cell. This decon area will consist of a liner with surrounding berms to contain the decon fluids and a sump for fluids collection. Collected solids will be returned to the Western Cell for incorporation under the cap. Collected fluids will be drummed and tested as appropriate to determine their final off-site disposition.

Detailed descriptions of the decon activities are contained in the EPP.

### **Eastern Cell Protection**

**Water Side Construction of Rock Cover** – Prior to the placement of the rock cover, the foot print of the area to receive the rock via water side placement (nominally water depths greater than -2 NAVD 88) on a daily basis will be covered with Skaps GT-112 or equivalent. This filter fabric comes in rolls that are 15 feet wide and 300 feet long. Fabric panels will be constructed that are approximately 29.5 feet wide by 300 feet long by stitching together two (2) rolls using a prayer seam. The fabric panel will then be placed on a 10 foot by 40 foot spud barge. The fabric panel will then be attached to a long boom track hoe on a 40 foot by 100 foot barge and pulled into place. The fabric panel will be weighted using concrete anchors, or other appropriate means of weighting, approximately every 20 feet on both sides. This represents slightly more than one day of water side rock placement. A long boom track hoe operating from a shallow draft barge will be used to place the rock cover. The rock will be off loaded from a separate materials barge and placed to the thicknesses desired. The rock will be placed in a controlled manner with the goal to limit the fall of the rock to less than two (2) feet when possible. The rock will be placed on the fabric panels such that the next successive fabric panel can be placed with a three (3) foot overlap. The barges will be moved as close to shore as possible (nominally -2 feet NAVD 88). The materials barges will be loaded from the barge slip at the La Barge dock facility located to the north and west of the site. The materials barge will be loaded on a daily basis with the appropriate rock cover materials for that days work and location (or the next days work and location based upon work progress).

**Land Side Construction of Rock Cover** – Prior to the placement of the rock cover, the foot print of the area to receive the rock via land side placement (nominally water depths less than -2 NAVD 88 and above the typical high water line) on a daily basis will be covered with Skaps GT-112 or equivalent. This filter fabric comes in rolls that are 15 feet wide and 300 feet long. Fabric panels will be constructed that are approximately 29 feet wide by 300 feet long by stitching together two (2) rolls using a prayer seam. The fabric panel will be located on the





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shoreline (in the dry) on a spool suspended by an all-terrain fork lift or equivalent. The ends of the panel will then be deployed outward until the desired end location is reached. Partial panels may be deployed in areas where needed or may be reserved for use in the Western Cell area. The fabric panel will be weighted using concrete anchors (or other appropriate means) approximately every 20 feet on both sides. A second panel will then be deployed adjacent to the first with a three (3) foot overlap resulting in a fabric covered area approximately 55 feet wide. This panel placement progression will proceed until all panels have been placed. Where the fabric panels overlap with either other land side placement or water side placement the fabric panels shall be overlapped by approximately 3 feet.

After at least three (3) panels have been placed USA will begin placing Armor Cover Materials over the fabric panel. Typically USA will place a rock finger approximately 18 feet wide and 4.5 feet thick out to termination. After the rock finger has been constructed USA will use a track hoe with a rock bucket to begin spreading the materials to the side resulting in a uniform Armor Cover of +/- 18 inches (this example is given for Armor Cap C, thicknesses of both the rock finger and the resulting Armor Cap will be adjusted depending upon the material type).

### **Western Cell Protection**

**Water Side Construction of Rock Cover** – Water side placement on the Western Cell area will follow the same procedures as defined for the Eastern Cell.

**Land Side Construction of Rock Cover** – Prior to the placement of the rock cover, the foot print of the area to receive the rock via land side placement (nominally the Western Cell land side placement will occur above the high tide line and be in the dry) on a daily basis will be covered with Skaps GT-112 or equivalent. This filter fabric comes in rolls that are 15 feet wide and 300 feet long. Fabric panels may be constructed that are approximately 29 feet wide by 300 feet long by stitching together two (2) rolls using a prayer seam. The fabric panel will be located on the shoreline (in the dry) on a spool suspended by an all-terrain fork lift or equivalent. The ends of the panel will then be deployed outward until the desired end location is reached. Partial panels may be deployed in areas where needed. A second panel will then be deployed adjacent to the first with a three (3) foot overlap resulting in a fabric covered area approximately 55 feet wide. This panel placement progression will proceed until all panels have been placed. Where the fabric panels overlap with either other land side placement or water side placement the fabric panels shall be overlapped by approximately 3 feet.

After the entire Western Cell has been covered with fabric, USA will begin placing the appropriate armor materials. Placement will be direct dumping from off road truck and spreading using a D-6 LGP dozer or equivalent.



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### Northwestern Area

Construction of Granular Cover - Water side placement on the Northwestern area will follow the same procedures as defined for the Eastern Cell. No filter fabric is planned to be placed below the Armor Cap A Materials.

### Anticipated Personnel, Equipment and Equipment

PERSONNEL:

- (1) Project Manager
- (1) Site Superintendent
- (1) Project Foreman
- (1) Monitoring, Scheduling & Sampling Supervisor (QA/QC)
- (1) Site Specific HSSE Officer
- (2) Site Security Officers
- (8) Equipment Operators
- (4) Field Technicians

EQUIPMENT:

- (1) D6MXL Power Angle Tilt Dozer w/Ripper, 140 HP, 6-Way Blade
- (1) PC300LC-6 KOMATSU 3YD 24'3" Depth, Excavator, 222 HP, 73,568 LB
- (1) 980G Wheel Loader, 7 YD, 318 HP, 67,000 LB
- (1) 2,500 Gallon Water Truck, 260 HP, PSI Spray
- (1) WA250PTC KOMATSU 135HP, 3 YD Loader
- (1) 120H Motor Grader, 125, HP, 12 Ft. Blade
- (3) 730 Articulated Truck, 30 TON, 321 HP, 51,000 LB
- (1) CS563E Smooth Drum, 84-Inch Vibratory Base Compactor
- (1) 1000 GAL, 6 Lube Fuel Truck
- (1) 14 YD, Tandem Axle Dump Truck
- (1) 580L CASE 14'3" Depth
- (7) Crew Trucks
- (1) Response Trucks
- (1) Office/Break Trailer with Gen Set
- (4) Port-O-Lets
- (21) Thermo Electron ADR-1200S Ambient Particle Monitors
- 14 Foot John Boat

SUPPLIES:

TXDOT 432 Rip Rap	TXDOT Grade I Flex Base
Skaps GT-112 Geotextile	Skaps GT-116 Geotextile
36-Inch RCP Pipe with Collar	
USEPA Level "C" & "D" PPE	Silt Fence
Orange Barricade Fencing	Traffic Control Signage

SUBCONTRACTORS:

- Land Surveying, Inc
- Shirley and Sons Construction, Inc
- Envirocon Systems, Inc



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Note: Equivalent equipment and/or materials may be substituted for items identified above



## 5.0 Project Keys

Major keys and/or potential issues with the performance of this scope of services are as follows:

- a) Flow from the Lake Houston Dam located upstream from the work site will greatly impact the water level in the work area. If heavy rains force the dam to discharge additional water work may be disrupted and environmental controls may be damaged. If drought conditions occur and the water discharge from the dam is curtailed, water borne activities may be disrupted due to barge and tug drafts.
- b) Strong, sustained winds from the north or the south will result in either lower (north winds) or higher (south winds) than forecasted.



## 6.0 Project Schedule

The detailed project schedule is attached as Appendix C.



## 7.0 Major Suppliers and Subcontractors

The following provides a summary of the major suppliers and subcontractors currently planned for the Revised Scope.

HPP	TxDOT Type 247 Grade I Armor Cap Materials A and B/C
GULF COAST LIMESTONE	Armor Cap Materials C and D
IWT/CARGOGUARD	Turbidity Barrier, Shore Anchor and Tow Bridle
ENVIROCON SYSTEMS, INC	Skaps GT-116, or equal Skaps GT-112, or equal Skaps GT-142 , or equal
LAND SURVEYING, INC.	Survey Control – Subcontractor
SHIRLEY & SONS CONSTRUCTION, INC	Water Born Activities Subcontractor



## APPENDIX A

### CONSTRUCTION SPECIFICATIONS

### TIME CRITICAL REMOVAL ACTION

### SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

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TECHNICAL SPECIFICATIONS  
SAN JACINTO RIVER WASTE PITS  
SUPERFUND SITE

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## LIST OF ACRONYMS AND ABBREVIATIONS

BMPs	best management practices
CFR	Code of Federal Regulations
CHASP	Contractor health and safety plan
CIH	certified industrial hygienist
CQAP	construction quality assurance plan
CQC	construction quality control
CWP	Contractor work plan
EPP	environmental protection plan
NAD	North American Datum
NAVD 88	North American Vertical Datum of 1988
NTCRA	non-Time Critical Removal Action
RAWP	removal action work plan
RTK	real-time kinematic
Site	San Jacinto River Waste Pits Superfund Site
SSP	Site security plan
TESC	temporary erosion and sedimentation control
TCRA	Time Critical Removal Action
TxDOT	Texas Department of Transportation
USEPA	United States Environmental Protection Agency

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## **1 INTRODUCTION**

### **1.1 TCRA Objectives**

The objectives of the Time Critical Removal Action (TCRA) at the San Jacinto River Waste Pits Superfund Site (Site) are to:

- Control erosion of waste materials
- Prevent direct human contact with the waste materials
- Prevent benthic contact with the waste materials

The TCRA will ultimately be part of the overall non-Time Critical Removal Action (NTCRA) or final remedy, which will address the Site and surrounding areas. The time between the TCRA completion and the NTCRA or final remedy is anticipated to be 2 to 7 years.

### **1.2 Summary of Work**

A summary of the work to be performed by the Contractor to complete the TCRA is outlined in these Technical Specifications and includes, but is not limited to, the following:

- Project Set Up
  - Mobilizing and demobilizing all personnel, equipment, supplies, offices, and other facilities necessary for the work.
  - Develop and implement a Site health and safety program.
  - Develop and implement a Site quality control program.
  - Develop and implement a Site security program.
  - Develop and implement an environmental protection program.
  - Conduct in-progress surveys of the work during construction to track progress and adjust cap placement operations as necessary.
  - Construct an access road and laydown area.
- Eastern Cell Protection
  - Implement erosion control measures as shown on Drawings.
  - Grade miscellaneous areas as necessary.
  - Construct an Armored Cap to the extents shown on the Drawings.
- Western Cell Protection

- Clear and grub to the extents shown on the Drawings, removing off-site vegetative material above grade. Smaller roots will be left on-site.
  - Implement erosion control measures as shown on Drawings.
  - Grade miscellaneous areas as necessary.
  - Construct an Armored Cap to the extents shown on the Drawings.
- Northwestern Area Protection
  - Construct an Armored Cap to the extents shown on the Drawings.

### **1.3 Terms and Conditions**

Standard General Conditions of the Construction Agreement are provided.

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## **2 CONSTRUCTION SEQUENCING, TIMING, AND OPERATIONS CONSTRAINTS**

### **2.1 Anticipated Sequencing of Construction**

The Contractor shall sequence their work in a manner that minimizes disturbance to other TCRA elements already completed. Work involving material placements shall generally be constructed from the lower elevations upward. Work within intertidal areas shall be sequenced to minimize the potential for erosion.

### **2.2 Timing**

Based on the current schedule, construction activities shall commence within 30 days of United States Environmental Protection Agency (USEPA) approval of the Removal Action Work Plan. The Contractor will develop a project schedule that is subject to review and approval of USEPA. The work shall be completed within 1 year of commencement of construction activities.

### **2.3 Operations Constraints**

The Site is adjacent to the San Jacinto River, Interstate 10, and residential and industrial areas. The Contractor shall be aware of, and follow, regulations related to working adjacent to these areas.

Material stockpile and equipment laydown locations that are available to the Contractor will be determined at a later date. Excavated materials from the Site shall not be transported to or stored offsite. As a condition of its use, upon demobilization, the Contractor shall leave the offsite properties in a condition at or better than its current condition. Any improvements made to the offsite properties shall be left in-place upon request of the property owner.

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### **3 CONSTRUCTION ELEMENTS**

The TCRA includes the following construction elements, which are described in further detail below:

- Project Set Up
- Armored Cap Construction

Cap construction will consist of both upland and in-water construction of an Armored Cap to protect the Eastern Cell, Western Cell, and Northwestern Area portions of the Site.

#### **3.1 Project Set Up**

Project set up includes all activities performed prior to, and in preparation for, TCRA activities and also includes demobilization following the completion and acceptance of construction. This element includes the following tasks:

- Mobilization and Demobilization
- Health and Safety
- Construction Quality Control
- Site Security
- Environmental Protection
- Survey Control
- Access Road Construction
- Off site properties Improvements

##### **3.1.1 Mobilization and Demobilization**

###### **3.1.1.1 Description of Work**

Work shall include costs necessary for mobilizing and demobilizing all personnel, equipment, supplies, offices, and other facilities necessary for the work, surveying, and cleanup. Provide and maintain sanitary facilities in sufficient numbers and at suitable locations for the use of all persons employed on the work Site. Provide sufficient drinking water for all employees. Mobilization shall consist of pre-construction expenses and costs or preparatory work and operations performed by the Contractor that occur before 10 percent of the Awarded Contract Price is earned from the other respective Bid Items.

Demobilization shall consist of post-construction expenses and work that occurs after 95 percent of the Awarded Contract Price is earned from other Bid Items.

For purposes of completing the Work, the Contractor shall consider utility identification to be incomplete. The Contractor is responsible for identifying and marking utilities within the work area in accordance with Texas One-Call law, and for protecting utilities throughout the duration of construction activities. The Contractor shall be responsible for any and all damage to any existing utilities caused by the Contractor's efforts.

#### *3.1.1.2 Materials and Quantities*

Not applicable to this Bid Item.

#### *3.1.1.3 Assumptions and Restrictions*

Overnight and daily parking of vehicles and equipment limitations are governed by the access agreement between TxDOT and the owners.

#### *3.1.1.4 Submittals*

The Contractor shall submit a Construction Work Plan (CWP) to Engineer for review and approval prior to mobilization to the Site. The CWP shall include, at a minimum, the following:

- Project schedule
- Proposed subcontractor(s) and their role(s)
- Procedures for identifying below-grade utilities in the work areas
- Proposed equipment and materials
- Methods for mobilizing equipment and materials to the Site
- Source(s) for cap materials, borrow source characterization reports, and analytical results
- Sources of geomembrane and geotextile materials
- Methods for installing the Armored Cap over the eastern Cell
- Methods for clearing and grubbing the western Cell
- Methods for installing and protecting the geomembrane in the western Cell



- Methods for quality control of geomembrane seaming
- Methods of ensuring no tracking of Site soils off-site
- Methods for grading the western Cell
- Methods for installing the Armored Cap over the western Cell
- Methods for installing the Armored Cap over the northwestern Area
- Demobilization
- Additional information as requested elsewhere in these specifications

The Contractor shall provide written notification of intent to commence work a minimum of seven days prior to the Contractor's scheduled date to commence work.

Following the completion of construction, the Contractor shall submit as-built Drawings and related documentation to Engineer within 15 days of substantial completion. Contractor shall also submit a copy of its field notes upon request.

#### **3.1.1.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.2      *Health and Safety***

#### **3.1.2.1      *Description of Work***

The Contractor will be responsible for safety and health for Site workers and the adjacent community during the implementation of the TCRA. The Contractor shall meet all provisions of local, state, and federal safety standards for construction. All Contractor activities shall comply with Hazardous Waste Operation and Emergency Response, 29 Code of Federal Regulations (CFR) 1910.120, where applicable.

The Contractor shall have a Health and Safety Representative, who shall, at a minimum be a Certified Industrial Hygienist (CIH). The Contractor shall also designate a full-time Site Safety Officer to monitor work efforts, verify that employees of the Contractor and

subcontractors are in compliance with the requirements of the Contractor's Health and Safety Plan (CHASP), and determine the need for additional worker protection. All workers shall have the necessary health and safety training needed to comply with work on the Site.

#### **3.1.2.2      *Materials and Quantities***

Not applicable to this Bid Item.

#### **3.1.2.3      *Submittals***

The Contractor shall submit a Contractor Health and Safety Plan (CHASP) to Engineer for review. The CHASP shall be prepared in accordance with the requirements of 29 CFR 1910.120 and 29 CFR 1926.65 and all other applicable OSHA regulations and published guidelines. The CHASP shall clearly define health and safety requirements for specific Site activities. The CHASP shall include employee training and medical certificates as appropriate.

The Contractor shall submit to Engineer amendments to the CHASP as appropriate throughout the duration of the Work. Activities related to the CHASP amendment shall not begin until the amendment has been submitted and reviewed.

#### **3.1.2.4      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.3      *Quality Control***

#### **3.1.3.1      *Description of Work***

The Contractor shall establish a Quality Control Program to perform inspection and testing of all items of work required by the specifications, including those performed by subcontractors. As part of this program, the Contractor shall establish, provide, and maintain a Construction Quality Control (CQC) Plan. The Contractor shall also establish a CQC

Supervisor. Daily CQC reports shall be submitted each day for the previous day's activities. Equipment and materials necessary for the CQC Plan shall be considered incidental to the different construction elements.

#### **3.1.3.2      *Materials and Quantities***

Not applicable to this bid item.

#### **3.1.3.3      *Submittals***

Contractor shall submit a Construction Quality Control (CQC) Plan to Engineer for review and approval. The CQC Plan shall detail the methods and procedures that will be taken to ensure that all materials and completed construction elements conform to contract Drawings, technical specifications, and other requirements, whether these elements be manufactured by the Contractor or procured from subcontractors or vendors. The CQC Plan shall specify the name and qualifications of the Contractor's proposed CQC Supervisor.

Daily CQC reports shall be submitted to Engineer each day for the previous day's activities. Daily CQC reports shall be submitted by noon on the following work day. Daily quantities of materials delivered to the Site, and quantities of materials graded and placed, shall be submitted in the daily CQC reports.

#### **3.1.3.4      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.4      *Site Security***

#### **3.1.4.1      *Description of Work***

The Contractor shall be responsible for providing Site security during all construction activities, both during working and non-working hours. The primary intent of Site security measures shall be to restrict access to remedial work areas at the Site as necessary. Those

workers entering remedial areas shall have appropriate training as defined in the CHASP. The security measures are also intended to prevent exposure of the public and non-authorized personnel to Site contaminants, and to minimize the incidence of Site theft. As part of this program, the Contractor shall establish, provide, and maintain a Site Security Plan (SSP) and enforce compliance with its provisions by all Contractor and subcontractor employees.

The Contractor shall maintain a daily log of visitors to the Site and make available to the Engineer on request. The visitor's log shall include date, name, address, company employed by, time in and time out, and a record of deliveries. Security breaches or incidents shall also be recorded on the visitor's log.

#### **3.1.4.2      *Materials and Quantities***

Not applicable to this Bid Item.

#### **3.1.4.3      *Assumptions and Restrictions***

The Contractor may make no claim against the Owner or Engineer for damage resulting from trespass.

#### **3.1.4.4      *Submittals***

The Contractor shall submit a Site Security Plan (SSP) to Engineer for approval, detailing the methods and procedures that will be taken to ensure that the Site is secured during working and non-working hours.

#### **3.1.4.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.5      *Environmental Protection***

#### **3.1.5.1      *Description of Work***

The Contractor shall establish an Environmental Protection Program that prevents environmental pollution, establishes temporary erosion and sedimentation controls (TESCs), and minimizes environmental degradation during, and as a result of, construction operations. The control of environmental pollution requires consideration of noise levels, air, water, and land.

This task should include costs for preparation of an Environmental Protection Plan (EPP), costs for purchase, installation, and maintenance of silt fences, silt curtains, and other measures identified in the EPP, and costs for inspections of installed environmental protection measures. The task shall also include costs to prevent the off-site transport of materials on equipment leaving the Site.

#### **3.1.5.2      *Materials and Quantities***

A silt fence shall be constructed around all upland construction activities. A silt curtain shall be installed around all in-water construction activities. The silt curtain shall be supported by floats at the top and weighted at the bottom. The silt curtain bottom shall be within 3 feet of the mudline at all times.

The Contractor shall install a Temporary Erosion Control Berm as shown on the Drawings. The intention of the berm is to control erosion of surface materials with the rising and falling of the tide and San Jacinto river levels. Temporary silt fences shall be installed around the perimeter of the construction area to minimize erosion of exposed soils into the river.

The Contractor shall purchase and install four signs offshore at the outer edges of the Site notifying mariners to stay out of the area.

#### **3.1.5.3      *Assumptions and Restrictions***

The Contractor can assume that the Engineer will perform all water quality monitoring during in-water activities. If water quality exceedances occur during material placement, Contractor shall be responsible for adjusting its operations or environmental protection

controls, as necessary, to achieve water quality monitoring results in compliance with relevant standards. Contractor shall not be paid standby time if operations must be temporarily suspended due to water quality monitoring results in exceedance of relevant standards.

#### **3.1.5.4      *Submittals***

The Contractor shall submit an Environmental Protection Plan (EPP) to Engineer for approval, which shall establish and maintain quality control for environmental protection of all items of the TCRA. At a minimum, the EPP shall include the following information:

- Proposed materials and methods to control erosion and turbidity
- Description of procedures for prompt maintenance and repair of installed erosion and turbidity controls
- Sheen and floating debris control measures
- Description of control procedures to decontaminate trucks importing fill material prior to the trucks leaving the Site (e.g., inspecting and brushing off visible dirt, wheel washing)
- Description of methods to decontaminate any equipment leaving the Site
- Description of measures to minimize wheel contact of trucks entering and leaving the Site with the exposed subgrade
- Site planning showing the location of TESC measures
- Fueling plan
- Emergency procedures to respond to a fuel spill on land or over water
- Methods to control dust for access road and other areas of the Site
- Description of best management practices that will be used to prevent or minimize stormwater from being exposed to pollutants from spills, cleaning and maintenance activities, and waste handling activities, including fuel, hydraulic fluid, and other oils from vehicles and machinery
- Projected date when TESC measures will be in place
- Projected date of removal of TESC structures (after soil is stabilized by vegetation or other means)

Any requested changes or modifications to the TESC measures shown on the Drawings shall be submitted in writing to the Engineer for approval prior to implementation.

### **3.1.5.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.6      *Survey Control***

#### **3.1.6.1      *Description of Work***

An accurate method of horizontal and vertical control shall be established by the Contractor before work begins. The Contractor shall lay out its work from horizontal and vertical control points indicated on the figures and shall be responsible for all measurement taken from these points.

Accuracy for topographic surveys completed for upland work shall be to the nearest 0.01-foot  $\pm 0.005$ -foot for elevation and to  $\pm 0.1$ -foot for horizontal distance.

The Contractor shall establish and maintain a tide gauge or board in a location where it may be clearly seen during in-water work. The Contractor shall employ a suitable method to locate and control horizontal and vertical in-water work. The Contractor is required to have real-time kinematic (RTK) controls for survey control work. Accuracy for measured depths for in-water work shall be  $\pm 0.25$  foot; accuracy of horizontal positions shall be  $\pm 3$  feet at the 95 percent confidence interval.

The Contractor shall safeguard all survey control points. Should any of these points be damaged or destroyed, the Contractor shall replace the control point at no cost to the Owner or Engineer. The Contractor shall assume the entire expense of rectifying work improperly constructed due to failure to maintain and protect established survey control points.

#### **3.1.6.2      *Materials and Quantities***

Not applicable to this Bid Item.

#### **3.1.6.3      *Assumptions and Restrictions***

The horizontal datum shall be Texas South Central, North American Datum (NAD) of 1983.  
The vertical datum shall be NAVD 1988 (2001 Adjusted).

The Contractor can assume that the Engineer will be responsible for all pre- and post-activity payment surveys.

#### **3.1.6.4      *Submittals***

As part of the Contractor's CWP, Contractor shall provide description of proposed survey equipment, qualifications of survey crew, and proposed survey control methods.

The Contractor shall provide cross sections of the installed work every two days during both in-water and upland work. The volume of material placed and the area affected shall also be determined every two days. The cross sections and volume calculation shall be submitted as part of the Daily CQC report by noon on the following work day.

Field notes shall be recorded during each survey event. Notes shall include weather conditions, equipment calibration records, time and date of measurements, surface water elevation measurements, surface water elevation, surface water conditions, etc. Contractor shall submit a copy of the survey field notes to the Engineer at the conclusion of construction.

If Contractor installs or replaces survey monuments during the completion of the work, Contractor shall provide a sealed survey of the monuments and verification that the survey was recorded in Harris County, within 15 days following the completion of work.



### **3.1.6.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.7      *Access Road Construction***

#### **3.1.7.1      *Description of Work***

Access road construction shall be to the limits shown on the Drawings. The subgrade shall be cleared of vegetation and leveled prior to the road construction. A separation geotextile shall be placed over the cleared and leveled subgrade prior to placing aggregate. Geotextile panels shall overlap by a minimum of 2 feet. After completion of the TCRA, the access roads shall remain in place.

#### **3.1.7.2      *Materials and Quantities***

The access road shall be a minimum of 12 feet wide, and in the general location shown on the Drawings. The road section shall be constructed of 12 inches of TxDOT Item 247, Grade 1 (Texas Department of Transportation 2004 Standard Specifications) over a separation geotextile specified by TxDOT.

#### **3.1.7.3      *Assumptions and Restrictions***

Assume that no additional fill materials will be required to create manageable grades, nor will excess soils have to be removed. Vegetation above the subgrade removed as part of the activities shall be removed from the Site and properly disposed of. Any soil adhering to vegetation root wads that have been removed as part of grubbing shall be removed from the root wads and placed evenly within the Western Cell prior to Armor Cap construction.

#### **3.1.7.4      *Submittals***

As part of CWP, include Contractor's proposed borrow source for TxDOT Item 247, Grade 1, and product information for Contractor's proposed separation geotextile.

### **3.1.7.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.1.8      *Offsite Properties Improvements***

#### **3.1.8.1      *Description of Work***

Contractor shall make improvements to the offsite properties as deemed necessary by the Contractor for the completion of the TCRA.

#### **3.1.8.2      *Materials and Quantities***

Not applicable to this Bid Item.

#### **3.1.8.3      *Assumptions and Restrictions***

Assume that no structures currently existing at the offsite properties may be removed. The Contractor is responsible for identifying and marking utilities at the offsite properties in accordance with Texas One-Call law, and for protecting utilities throughout the duration of construction activities. The Contractor shall be responsible for any and all damage to any existing utilities caused by the Contractor's efforts. All proposed improvements to the offsite properties are subject to the approval of the Engineer and the property owner.

The Contractor shall provide for the duration of the Site work, an on-site field office complex with an office space of not less than 1,000 square feet, for exclusive use of Engineer and Government personnel. The above facility shall be located at the concrete slab located on the offsite properties as shown on the Drawings. The office may be a portable trailer or building. The field office shall be secured in place using tie downs capable of withstanding winds of up to 75 miles per hour. The Contractor shall provide full electric, central Heating Ventilating and Air Conditioning (HVAC) system, water supply, and sewage removal utility services. The Contractor shall be responsible for physical and fire protection, security, repairs from vandalism, and replacements from theft of the office facility and contents. This

facility shall be ready for occupancy within 30 days and fully completed within 45 days after acknowledgment of the Notice to Proceed and prior to any on-site construction activities.

#### **3.1.8.4      *Submittals***

As part of CWP, include Contractor's proposed Site improvements for the offsite properties.

#### **3.1.8.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.2      *Armored Cap Construction***

The extent of work for the Armored Cap construction is indicated on the Drawings. This element includes the following tasks:

- Clearing and grubbing
- Upland surface grading
- Geotextile placement
- Geomembrane placement
- Placement of Armor Cap material

#### **3.2.1      *Clearing and Grubbing***

##### **3.2.1.1      *Description of Work***

Contractor shall cut at the ground surface and remove surface vegetation from the cap areas in preparation for future surface grading and/or cap placement. Roots from vegetation 8 inches in diameter or smaller shall be grubbed and evenly distributed across the Western Cell prior to geotextile placement. The intent is to avoid uneven pockets of vegetative mass under the cap. Roots from vegetation greater than 8 inches in diameter shall be grinded and spread evenly across the Western Cell.

### **3.2.1.2      *Materials and Quantities***

Not applicable to this Bid Item.

### **3.2.1.3      *Assumptions and Restrictions***

Contractor shall not pump water from the area to be cleared and grubbed into any surface waters, stream corridors, or wetlands; if water is pumped, it shall be collected and disposed off-site. Disposal of trees, brush, and other debris in any surface waters, stream corridors, wetlands, or at unspecified locations is prohibited. Open fires are not allowed.

### **3.2.1.4      *Submittals***

As part of the Contractor's CWP, Contractor shall provide description of equipment and methods proposed to complete the removal of vegetation. Include a description of methods to be employed to decontaminate trucks for hauling vegetation, or methods such as temporary haul roads to be employed to prevent contact between the trucks and paper mill sludge.

As part of the Contractor's CWP, Contractor shall also provide the name and location of the proposed facility for the disposal of removed vegetation.

### **3.2.1.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

## **3.2.2      *Surface Grading***

### **3.2.2.1      *Description of Work***

Contractor shall grade the surface of the Site to achieve the surface elevations specified on the Drawings. In addition, some areas of isolated grading may be required after clearing and grubbing are complete. If significant grading is to occur in the Western Cell, prior to

commencing surface grading, the Contractor shall install an erosion control structure along the northwest portion of the Western Cell as shown on the Drawings.

### **3.2.2.2      *Materials and Quantities***

Contractor shall complete grading using existing earthen material from the perimeter berms surrounding the Western Cell. Based on existing Site topography data, approximately 200 cubic yards of material will require grading to achieve the elevations specified in the Drawings.

### **3.2.2.3      *Assumptions and Restrictions***

Earthwork for Site grading shall be completed using cut materials from the Site as shown on the Drawings. The intent is to keep all cut material on-site and use it as fill beneath the Armored Cap. If paper mill sludge is encountered during surface grading activities, the Contractor shall notify the Engineer immediately and provide recommendations for completing the surface grading activities while minimizing or eliminating the handling of the paper mill sludge.

The cut material shall be placed in an initial lift resulting in a 24-inch maximum horizontal layer, compacted with at least three passes of crawler-type tractors or power-drive tampers. Subsequent lifts shall be placed in 12-inch maximum horizontal layers and compacted in the same manner.

Contractor shall not pump water from the area to be graded into any surface waters, stream corridors, or wetlands; if water is pumped, it shall be collected and disposed off-site.

Contractor shall employ best management practices (BMPs) for TESC's in the work area to prevent the loss of soil due to natural causes such as storm events, surface water runoff, and wind, and to prevent the introduction of sediment to adjacent wetlands or water bodies.

The final surface elevations for the graded area must be within  $\pm 0.25$  foot of the elevations specified on the Drawings.

#### **3.2.2.4      *Submittals***

As part of the Contractor's CWP, Contractor shall provide description of equipment and methods proposed to complete surface grading of the Site, and provide description of TESC's to be employed during surface grading activities.

#### **3.2.2.5      *Measurement and Payment***

This Bid Item will be measured on a lump sum basis. Payment will be made on review and acceptance by Engineer for the total value listed for this Bid Item on the Bid Form. Progress payments may be made based upon estimated percent complete as requested in Contractor's Application for Payment and approved by Engineer.

### **3.2.3      *Filter Geotextile***

#### **3.2.3.1      *Description of Work***

Prior to placement of the Armor Cap material, a geotextile shall be placed atop the surface, below the Armored Caps as shown on the Drawings. Geotextile panels shall overlap by a minimum of 3 feet. The geotextile shall be placed atop the mud line where grading did not occur. The geotextile shall be placed atop the graded surface in the Western Cell following acceptance of the graded surface by Engineer. The geotextile shall be anchored per manufacturer's recommendations on slopes to prevent creep of the geotextile down slope.

#### **3.2.3.2      *Materials and Quantities***

The Filter Geotextile shall be Mirafi 1120N or equivalent.

#### **3.2.3.3      *Assumptions and Restrictions***

The Contractor shall propose a method to the Engineer that confirms the minimum 3 feet of overlap was obtained and present it in the CWP and CQAP.

The Filter Geotextile will be used under all Armored Caps except beneath Armor Cap A in the Northwestern Area.

Water quality monitoring will be conducted by the Engineer and will occur during in-water activities as described in the Bid Item for Environmental Protection. In-water construction operations shall be adjusted to meet water quality criteria if water quality exceedances occur during geotextile placement. Armored Caps on slopes shall be placed from the toe of the slope upward.

#### **3.2.3.4      *Submittals***

As part of CWP, include product information sheet for Contractor's proposed Filter Geotextile.

#### **3.2.3.5      *Measurement and Payment***

This Bid Item will be measured per square yard of geotextile furnished and installed. The per square yard unit rate shall be extended by the estimated bid quantity to establish a Lump Sum Cost. Square yardage will be measured based on the size of the upland and in-water installation areas; overlapping panel quantities or delivered quantities of geotextile to the Site will not be considered as a basis for measurement and payment.

### **3.2.4      *Geomembrane Placement***

#### **3.2.4.1      *Description of Work***

The seamed geomembrane shall be installed to the extents shown on the Drawings. The geomembrane shall be placed in such a manner to minimize resuspension of sediment or damage the geomembrane. The Contractor shall develop and implement quality control/quality assurance methods in conformance with manufacturer's recommendations to monitor proper installation, seam construction, and membrane protection. Seam welds shall be tested according to ASTM D 6365 (Nondestructive Testing of Geomembranes using the Spark Test), unless an alternate method is proposed by the Contractor and approved by the Engineer.

#### **3.2.4.2      *Materials and Quantities***

The geomembrane shall be linear low density polyethylene (LLDPE), 40 mil thickness, or equivalent. Prior to installation, geomembrane materials shall be stored and handled in such

a fashion as to protect them from damage due to construction, weather, chemicals, excess temperature, and extended exposure to ultraviolet radiation. The Contractor shall protect the geomembrane from damage due to subgrade conditions and from damage due to the overlying armor materials using either a sand layer or cushion geotextile per the manufacturer's recommendation and as directed by the Engineer. Vents shall be installed as shown on the drawings and installed per the manufacturer's recommendations.

#### **3.2.4.3      *Assumptions and Restrictions***

The geomembrane shall be placed following the manufacturer's recommendations for the following:

- Subgrade preparation
- Placing of the geomembrane
- Seaming of the membrane
- Anchoring of the membrane

The geomembrane shall be anchored on all sides to prevent the edge from being exposed. If an anchor trench is used along the north side, all excavated materials shall be managed on-site and placed in an even lift thickness below the geomembrane. The Contractor shall not operate heavy equipment directly on the surface of the installed geomembrane.

#### **3.2.4.4      *Submittals***

As part of CWP, include Contractor's proposed source for the materials. Include, at a minimum, the company name, address, and phone number for the proposed source(s).

As part of Contractor's daily CQC report, include a photocopy of delivery tickets for the different materials transported to the Site and documentation on seam integrity testing. Daily CQC reports shall be submitted by noon on the following work day.

#### **3.2.4.5      *Measurement and Payment***

This Bid Item will be measured per square yard of geomembrane installed. The price shall include all necessary cushion materials above and below the geomembrane. The per square



yard unit rate shall be extended by the estimated bid quantity to establish a Lump Sum Cost. Square yardage will be measured based on the size of the installation areas.

### **3.2.5     *Armored Cap Construction***

#### **3.2.5.1     *Description of Work***

The Armored Cap shall be constructed to the extents and thickness shown on the Drawings with the different materials identified on the Drawings. The Armored Cap shall be placed in such a manner to minimize resuspension of sediments or damage to the geotextile. All cap material placed on slopes must be placed from the toe of the slope up towards the crest.

The Contractor shall establish procedures for monitoring the rate of material placement, including the use of a positioning system, and methods for determining the rate of material placed. The Contractor shall also develop quality control/quality assurance methods to monitor placement rates and thickness.

#### **3.2.5.2     *Materials and Quantities***

There are 4 different Armor Cap material gradations as defined below:

- Armor Cap Material A:
  - 80 percent by weight of well graded recycled concrete or crushed natural rock with the following gradation requirements:
    - 100% passing 6 inches
    - No more than 50% passing 3 inches
    - No more than 4% passing the #200 sieve
  - 20 percent by weight of gravelly sand with the following gradation requirements:
    - 100% passing 3/8-inch sieve
    - 50% to 90% passing the #4 sieve
    - 10% to 40% passing the #10 sieve
    - No more than 4% passing the #200 sieve
- Armor Cap Material B/C. Well graded recycled concrete or crushed natural rock with the following gradation requirements:
  - 100% passing 12 inches

- No more than 50% passing 6 inches
  - No more than 4% passing the #200 sieve
- Armor Cap Material C. Well graded crushed natural rock with the following gradation requirements:
  - 100% passing 12 inches
  - No more than 50% passing 6 inches
  - No more than 4% passing the #200 sieve
- Armor Cap Material D. Well graded crushed natural rock with the following gradation requirements:
  - 100% passing 18 inches
  - No more than 50% passing 8 inches
  - No more than 4% passing the #200 sieve

The Armor Cap materials shall be clean, granular material free of roots, organic material, contaminants, and all other deleterious and objectionable material. Samples will need to be analyzed by the Contractor for the list of analytes in Table 1.

### **3.2.5.3      *Assumptions and Restrictions***

Use of spuds will not be allowed in areas previously capped.

If the Armor Cap material proposed by the Contractor requires on-site mixing of two or more borrow materials, the Contractor shall be responsible for identifying and maintaining an on-site area for Armor Cap material mixing and stockpiling. The Contractor shall mix the borrow materials to the satisfaction of the Engineer prior to placement. Contractor's costs for mixing of borrow materials are incidental to the Bid Item.

The Armor Materials shall be placed in such a manner as to prevent damage to the geomembrane and geotextile materials.

Water quality monitoring will be conducted by the Engineer and will occur during in-water activities as described in the Bid Item for Environmental Protection. In-water construction

operations shall be adjusted to meet water quality criteria if water quality exceedances occur during material placement.

#### **3.2.5.4      *Submittals***

As part of CWP, include Contractor's proposed source for the different Armor Cap materials. Include, at a minimum, the company name, address, and phone number for the proposed source(s), material gradation curves, and laboratory analytical results for the samples analyzed as described in Section 3.2.4.2. For Armor Cap Material A, the Contractor shall submit separate gradation analyses for the crushed rock component, the sand component, and the mixed material and a brief description of proposed methods for blending these materials to achieve the required 80/20 weight ratio of crushed rock to sand.

As part of Contractor's daily CQC report, include a photocopy of weigh tickets for Armor Cap materials transported to the Site. Daily CQC reports shall be submitted by noon on the following work day.

#### **3.2.5.5      *Measurement and Payment***

This Bid Item will be measured per ton of Armored Cap materials furnished and constructed. The per ton unit rate shall be extended by the estimated bid quantity to establish a Lump Sum Cost. Tonnage will be based on weight slips provided by the approved borrow source.

The per ton unit rate for Armor Cap materials shall be established for each type of Armored Cap material and for each method of placement, as follows:

- Armor Cap Material A
- Armor Cap Material B/C
- Armor Cap Material C
- Armor Cap Material D

For payment purposes, an overplacement allowance of up to 6 inches will be given to account for the accuracy of placing the material below elevation 2 feet NAVD 88. No overplacement allowance will be given for materials placed above elevation 2 feet NAVD 88. This overplacement allowance is included in the quantity provided in the Bid Table (Table 2).

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#### **4 SUMMARY OF SUBMITTALS**

A summary of the submittals required by these Technical Specifications is provided in the Construction Quality Assurance Plan (CQAP), which is Attachment G to the RAWP.

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## **5 REFERENCES**

Texas Department of Transportation, 2004. Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges. Adopted by the Texas Department of Transportation June 1, 2004.

## TABLES

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**Table 1**  
**Armored Cap Material Analyte List**

Parameter	Analytical Method	Reporting Limit (mg/kg)	TCEQ Tier I Residential Soil PCLs <sup>(1)</sup> (mg/kg)	TRRP Tier 1 Sediment PCLs <sup>(4)</sup> (mg/kg)	TCEQ Marine PEL <sup>(5)</sup> (mg/kg)	Required Fill Chemical Concentration Criteria (mg/kg)
<b>Metals</b>						
Aluminum	6010B/6020	10	6.4E+04	150000	NL	6.4E+04
Antimony	6010B/6020	0.5	2.7E+00	83	NL	2.7E+00
Arsenic	6010B/6020	5.0	2.5E+00	110	41.6	4.2E+01
Cadmium	6010B/6020	0.50	7.5E-01	1100	4.21	4.2E+00
Chromium	6010B/6020	0.50	1.2E+03	36000	160.4	1.6E+02
Copper	6010B/6020	1.00	5.2E+02	21000	108.2	1.1E+02
Lead	6010B/6020	2.0	1.5E+00	500	112.18	1.1E+02
Mercury	7471A	0.020	3.9E-03	34	0.696	7.0E-01
Nickel	6010B/6020	2.0	7.9E+01	1400	42.8	4.3E+01
Silver	6010B/6020	0.50	2.4E-01	350	1.77	1.8E+00
Zinc	6010B/6020	5.0	1.2E+03	76000	271	2.7E+02
<b>Semivolatile Organic Compounds</b>						
1,2,4-Trichlorobenzene	8270C	0.10	2.4E+00	1500	--	2.4E+00
1,2-Dichlorobenzene	8270C	0.10	8.9E+00	66000	--	8.9E+00
1,3-Dichlorobenzene	8270C	0.10	3.4E+00	22000	--	3.4E+00
1,4-Dichlorobenzene	8270C	0.10	1.1E+00	2300	--	1.1E+00
2,4-Dimethylphenol	8270C	0.10	1.6E+00	3100	--	1.6E+00
2-Methylnaphthalene	8270C	0.10	8.5E+00	2500	NL	8.5E+00
2-Methylphenol	8270C	0.10	3.6E+00	7700	--	3.6E+00
4-Methylphenol	8270C	0.10	3.2E-01	770	--	3.2E-01
Acenaphthene	8270C	0.01	1.2E+02	7400	0.0889	8.9E-02
Acenaphthylene	8270C	0.10	2.0E+02	7400	0.12787	1.3E-01
Anthracene	8270C	0.10	3.4E+03	37000	0.245	2.5E-01
Benz[a]anthracene	8270C	0.10	5.6E+00	16	0.69253	6.9E-01
Benzo[a]pyrene	8270C	0.10	5.6E-01	1.6	0.76322	5.6E-01
Benzo[b]fluoranthene	8270C	0.10	5.7E+00	16	--	5.7E+00
Benzo[g,h,i]perylene	8270C	0.10	1.8E+03	3700	--	1.8E+03
Benzo[k]fluoranthene	8270C	0.10	5.7E+01	160	--	5.7E+01
Benzoic acid	8270C	0.60	9.5E+01	610000	NL	9.5E+01
Benzyl alcohol	8270C	0.10	2.9E+00	46000	NL	2.9E+00
Bis[2-ethylhexyl]phthalate	8270C	0.10	4.3E+01	240	--	4.3E+01
Butyl benzyl phthalate	8270C	0.10	1.3E+02	31000	--	1.3E+02
Chrysene	8270C	0.10	5.6E+02	1600	0.84598	8.5E-01
Dibenz[a,h]anthracene	8270C	0.10	5.5E-01	1.6	0.13461	1.3E-01
Diethyl phthalate	8270C	0.10	7.8E+01	120000	--	7.8E+01
Dimethyl phthalate	8270C	0.10	3.1E+01	120000	--	3.1E+01
Di-n-butyl phthalate	8270C	0.10	1.7E+03	15000	--	1.7E+03
Di-n-octyl phthalate	8270C	0.10	1.3E+03	3100	--	1.3E+03
Fluoranthene	8270C	0.10	9.6E+02	4900	1.49354	1.5E+00
Fluorene	8270C	0.10	1.5E+02	4900	0.14435	1.4E-01
Hexachlorobenzene	8270C	0.10	5.6E-01	8.9	NL	5.6E-01
Hexachlorobutadiene	8270C	0.10	1.6E+00	31	--	1.6E+00
Hexachloroethane	8270C	0.10	9.2E-01	150	--	9.2E-01
Indeno[1,2,3-c,d]pyrene	8270C	0.10	5.7E+00	16	--	5.7E+00
Naphthalene	8270C	0.10	1.6E+01	2500	0.39064	3.9E-01
N-nitrosodiphenylamine	8270C	0.10	1.4E+00	900	--	1.4E+00
Pentachlorophenol	8270C	0.20	9.2E-03	56	--	9.2E-03

**Table 1**  
**Armored Cap Material Analyte List**

Parameter	Analytical Method	Reporting Limit (mg/kg)	TCEQ Tier I Residential Soil PCLs <sup>(1)</sup> (mg/kg)	TRRP Tier 1 Sediment PCLs <sup>(4)</sup> (mg/kg)	TCEQ Marine PEL <sup>(5)</sup> (mg/kg)	Required Fill Chemical Concentration Criteria (mg/kg)
Phenanthrene	8270C	0.10	2.1E+02	3700	0.54353	5.4E-01
Phenol	8270C	0.10	9.6E+00	92000	--	9.6E+00
Pyrene	8270C	0.10	5.6E+02	3700	1.3976	1.4E+00
<b>Volatile Organic Compounds (VOCs)</b>						
1,1,1,2-Tetrachloroethane	8260B	0.0050	7.1E-01	2100	NL	7.1E-01
1,1,1-Trichloroethane	8260B	0.0050	8.1E-01	150000	--	8.1E-01
1,1,2,2-Tetrachloroethane	8260B	0.0050	1.2E-02	270	--	1.2E-02
1,1,2-Trichloroethane	8260B	0.0050	1.0E-02	960	--	1.0E-02
1,1-Dichloroethane	8260B	0.0050	9.2E+00	73000	--	9.2E+00
1,1-Dichloroethene	8260B	0.0050	2.5E-02	91	--	2.5E-02
1,1-Dichloropropene	8260B	0.0050	6.7E-02	540	NL	6.7E-02
1,2,3-Trichlorobenzene	8260B	0.0050	1.3E+01	460	NL	1.3E+01
1,2,3-Trichloropropane	8260B	0.0050	2.7E-04	7.8	NL	2.7E-04
1,2,4-Trimethylbenzene	8260B	0.0050	4.9E+00	37000	NL	4.9E+00
1,2-Dibromo-3-chloropropane	8260B	0.0100	8.7E-04	10	NL	8.7E-04
1,2-Dichloroethane	8260B	0.0050	6.9E-03	600	--	6.9E-03
1,2-Dichloropropane	8260B	0.0050	1.1E-02	800	--	1.1E-02
1,3,5-Trimethylbenzene	8260B	0.0050	2.7E+01	37000	NL	2.7E+01
1,3-Dichloropropane	8260B	0.0050	3.2E-02	540	NL	3.2E-02
1,4-Dichlorobenzene	8260B	0.0050	1.1E+00	2300	NL	1.1E+00
2,2-Dichloropropane	8260B	0.0050	6.0E-02	800	NL	6.0E-02
2-Butanone	8260B	0.0250	1.5E+01	440000	NL	1.5E+01
2-Chlorotoluene	8260B	0.0050	4.5E+00	3100	NL	4.5E+00
2-Hexanone	8260B	0.0250	1.6E-01	44000	NL	1.6E-01
4-Chlorotoluene	8260B	0.0050	2.5E+00	15000	NL	2.5E+00
4-Isopropyltoluene	8260B	0.0050	NL	NL	NL	
4-Methyl-2-Pentanone	8260B	0.0250	2.5E+00	59000	NL	2.5E+00
Acetone	8260B	0.0500	2.1E+01	73000	NL	2.1E+01
Benzene	8260B	0.0050	1.3E-02	990	--	1.3E-02
Bromobenzene	8260B	0.0050	1.2E+00	15000	NL	1.2E+00
Bromochloromethane	8260B	0.0050	1.5E+00	29000	NL	1.5E+00
Bromodichloromethane	8260B	0.0050	3.3E-02	880	NL	3.3E-02
Bromoethane	8260B	0.0100	NL	NL	NL	
Bromoform	8260B	0.0050	3.2E-01	6900	--	3.2E-01
Bromomethane	8260B	0.0100	6.5E-02	1000	--	6.5E-02
Carbon Disulfide	8260B	0.0050	6.8E+00	73000	NL	6.8E+00
Carbon Tetrachloride	8260B	0.0050	3.1E-02	420	--	3.1E-02
Chlorobenzene	8260B	0.0050	5.5E-01	15000	--	5.5E-01
Chloroethane	8260B	0.0100	1.5E+01	290000	--	1.5E+01
Chloroform	8260B	0.0050	5.1E-01	7300	--	5.1E-01
Chloromethane	8260B	0.0100	2.0E-01	4200	--	2.0E-01
cis-1,2-Dichloroethene	8260B	0.0050	1.2E-01	7300	NL	1.2E-01
cis-1,3-Dichloropropene	8260B	0.0050	3.3E-03	73	--	3.3E-03
Dibromochloromethane	8260B	0.0050	2.5E-02	650	--	2.5E-02
Dibromomethane	8260B	0.0050	5.6E-01	7300	NL	5.6E-01
Dichlorodifluoromethane	8260B	0.0050	1.2E+02	150000	NL	1.2E+02
Ethylbenzene	8260B	0.0050	3.8E+00	73000	--	3.8E+00
Ethylene Dibromide	8260B	0.0050	1.0E-04	0.64	NL	1.0E-04



**Table 1**  
**Armored Cap Material Analyte List**

Parameter	Analytical Method	Reporting Limit (mg/kg)	TCEQ Tier I Residential Soil PCLs <sup>(1)</sup> (mg/kg)	TRRP Tier 1 Sediment PCLs <sup>(4)</sup> (mg/kg)	TCEQ Marine PEL <sup>(5)</sup> (mg/kg)	Required Fill Chemical Concentration Criteria (mg/kg)
Isopropylbenzene	8260B	0.0050	1.7E+02	73000	NL	1.7E+02
m,p-Xylene	8260B	0.0100	5.3E+01	1000000	--	5.3E+01
Methyl tert-Butyl Ether	8260B	0.0500	3.1E-01	7300	NL	3.1E-01
Methylene Chloride	8260B	0.0050	6.5E-03	7300	--	6.5E-03
Naphthalene	8260B	0.0050	1.6E+01	2500	NL	1.6E+01
n-Butylbenzene	8260B	0.0050	6.1E+01	6100	NL	6.1E+01
n-Propylbenzene	8260B	0.0050	2.2E+01	29000	NL	2.2E+01
o-Xylene	8260B	0.0050	3.5E+01	1000000	--	3.5E+01
sec-Butylbenzene	8260B	0.0050	4.2E+01	29000	NL	4.2E+01
Styrene	8260B	0.0050	1.6E+00	150000	NL	1.6E+00
tert-Butylbenzene	8260B	0.0050	5.0E+01	29000	NL	5.0E+01
Tetrachloroethene	8260B	0.0050	2.5E-02	1000	--	2.5E-02
Toluene	8260B	0.0050	4.1E+00	150000	--	4.1E+00
trans-1,2-Dichloroethene	8260B	0.0050	2.5E-01	15000	--	2.5E-01
trans-1,3-Dichloropropene	8260B	0.0050	1.8E-02	540	--	1.8E-02
Trichloroethene	8260B	0.0050	1.7E-02	4400	--	1.7E-02
Trichlorofluoromethane	8260B	0.0050	6.4E+01	220000	NL	6.4E+01
Vinyl Chloride	8260B	0.0100	1.1E-02	36	--	1.1E-02
<b>Organochlorine Pesticides</b>						
DDD	8081A	0.0050	6.5E+00	120	--	6.5E+00
DDE	8081A	0.0050	5.9E+00	87	--	5.9E+00
DDT	8081A	0.0050	5.4E+00	87	0.0517	5.2E-02
Aldrin	8081A	0.0050	5.0E-02	0.84	--	5.0E-02
Dieldrin	8081A	0.0010	2.4E-02	0.89	0.0043	4.3E-03
alpha-BHC	8081A	0.0005	4.0E-03	4.1	--	4.0E-03
beta-BHC	8081A	0.0050	1.4E-02	14	--	1.4E-02
delta-BHC	8081A	0.0050	8.7E-02	14	--	8.7E-02
gamma-BHC (Lindane)	8081A	0.0005	4.6E-03	20	0.00099	9.9E-04
alpha-Chlordane	8081A	0.0050	1.3E+01	41	NL	1.3E+01
gamma-Chlordane	8081A	0.0050	7.3E+00	73	NL	7.3E+00
alpha-Endosulfan	8081A	0.0050	2.3E+00	310	--	2.3E+00
beta-Endosulfan	8081A	0.0050	2.3E+00	920	--	2.3E+00
Endosulfan sulfate	8081A	0.0050	3.8E+02	920	--	3.8E+02
Endrin	8081A	0.0050	3.8E-01	46	--	3.8E-01
Endrin aldehyde	8081A	0.0050	1.9E+01	46	NL	1.9E+01
Endrin ketone	8081A	0.0050	1.9E+01	46	NL	1.9E+01
Heptachlor	8081A	0.0050	9.4E-02	3.2	--	9.4E-02
Heptachlor epoxide	8081A	0.0050	2.9E-02	1.6	--	2.9E-02
Methoxychlor	8081A	0.010	6.2E+01	770	--	6.2E+01
Mirex	8081A	0.0050	1.3E+01	NL	--	1.3E+01
cis-Nonachlor	8081A	0.0050	5.6E+00	41	NL	5.6E+00
Oxychlordane	8081A	0.0050	5.6E+00	41	NL	5.6E+00
Toxaphene	8081A	0.20	1.2E+00	13	--	1.2E+00
Trans-Nonachlor	8081A	0.0050	5.6E+00	41	NL	5.6E+00
<b>Chlorinated Herbicides</b>						
2,4,5-T	8151	0.020	NL	NL	--	
2,4-D	8151	0.050	NL	2500	--	2.5E+03
2,4-D	8151	0.20	NL	2500	--	2.5E+03

**Table 1**  
**Armored Cap Material Analyte List**

Parameter	Analytical Method	Reporting Limit (mg/kg)	TCEQ Tier I Residential Soil PCLs <sup>(1)</sup> (mg/kg)	TRRP Tier 1 Sediment PCLs <sup>(4)</sup> (mg/kg)	TCEQ Marine PEL <sup>(5)</sup> (mg/kg)	Required Fill Chemical Concentration Criteria (mg/kg)
Dalapon	8151	0.500	2.9E-01	4600	NL	2.9E-01
Dicamba	8151	0.020	7.3E-01	4600	NL	7.3E-01
Dichlorprop	8151	0.050	2.3E-01	1500	NL	2.3E-01
Dinoseb	8151	0.025	1.8E-01	150	NL	1.8E-01
MCPA	8151	1	1.2E-02	77	NL	1.2E-02
MCPP	8151	1	2.3E-02	150	NL	2.3E-02
Silvex	8151	0.020	2.6E+00	1200	NL	2.6E+00
<b>Polychlorinated Biphenyls (PCBs)</b>						
Total PCBs	8082	0.070	1.1E+00	2.3	0.1887	1.9E-01
<b>Dioxin/Furans, ng/kg</b>						
<b>Dioxins</b>		ng/kg <sup>(2)</sup>	ng/kg <sup>(2)</sup>	ng/kg <sup>(2)</sup>	ng/kg <sup>(2)</sup>	ng/kg <sup>(2)</sup>
2,3,7,8-TCDD	1613B	1.0	(3)	(3)	NL	(3)
1,2,3,7,8-PeCDD	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,4,7,8-HxCDD	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,6,7,8-HxCDD	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,7,8,9-HxCDD	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,4,6,7,8-HpCDD	1613B	5.0	(3)	(3)	NL	(3)
OCDD	1613B	10	(3)	(3)	NL	(3)
<b>Furans</b>						
2,3,7,8-TCDF	1613B	1.0	(3)	(3)	NL	(3)
1,2,3,7,8-PeCDF	1613B	5.0	(3)	(3)	NL	(3)
2,3,4,7,8-PeCDF	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,4,7,8-HxCDF	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,6,7,8-HxCDF	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,7,8,9-HxCDF	1613B	5.0	(3)	(3)	NL	(3)
2,3,4,6,7,8-HxCDF	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,4,6,7,8-HpCDF	1613B	5.0	(3)	(3)	NL	(3)
1,2,3,4,7,8,9-HpCDF	1613B	5.0	(3)	(3)	NL	(3)
OCDF	1613B	10	(3)	(3)	NL	(3)

**Notes:**

1. TCEQ TRRP Tier I Residential Soil PCL Values, 30-acre source area, includes Total Soil Combined and GW Soil Ingestion (Class 1) exposure routes.
  2. Dioxin/furan concentrations expressed in ng/kg. All other concentrations in table expressed in mg/kg.
  3. Acceptable dioxin/furan concentration is less than 0.45 ng/kg of 2,3,7,8-TCDD and 5 ng/kg TEQ based on WHO 2005<sup>(6)</sup> TEFs
  4. TCEQ TRRP Tier 1 Sediment PCL Values, includes ingestion and dermal pathways
  5. TCEQ Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data, 2004
  6. Van den Berg et al. 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicological Sciences 93(2): 223-241.
- NL - Not Listed  
-- No value given



## APPENDIX B

### CONSTRUCTION DRAWINGS

### TIME CRITICAL REMOVAL ACTION

### SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

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TIME CRITICAL REMOVAL ACTION

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

CHANNELVIEW, HARRIS COUNTY, TEXAS

VICINITY MAP



GENERAL NOTES

1. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF PROJECT SPECIFICATIONS, PERMITS AND ALL APPLICABLE REGULATIONS AND ORDINANCES.

2. THE CONTRACTOR SHALL AT ALL TIMES KEEP ITS CONSTRUCTION AREAS FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH; AND PRIOR TO COMPLETION OF THE WORK, THE CONTRACTOR SHALL REMOVE ANY RUBBISH FROM THE PREMISES AND ALL TOOLS, EQUIPMENT, AND MATERIALS NOT THE PROPERTY OF THE OWNER.

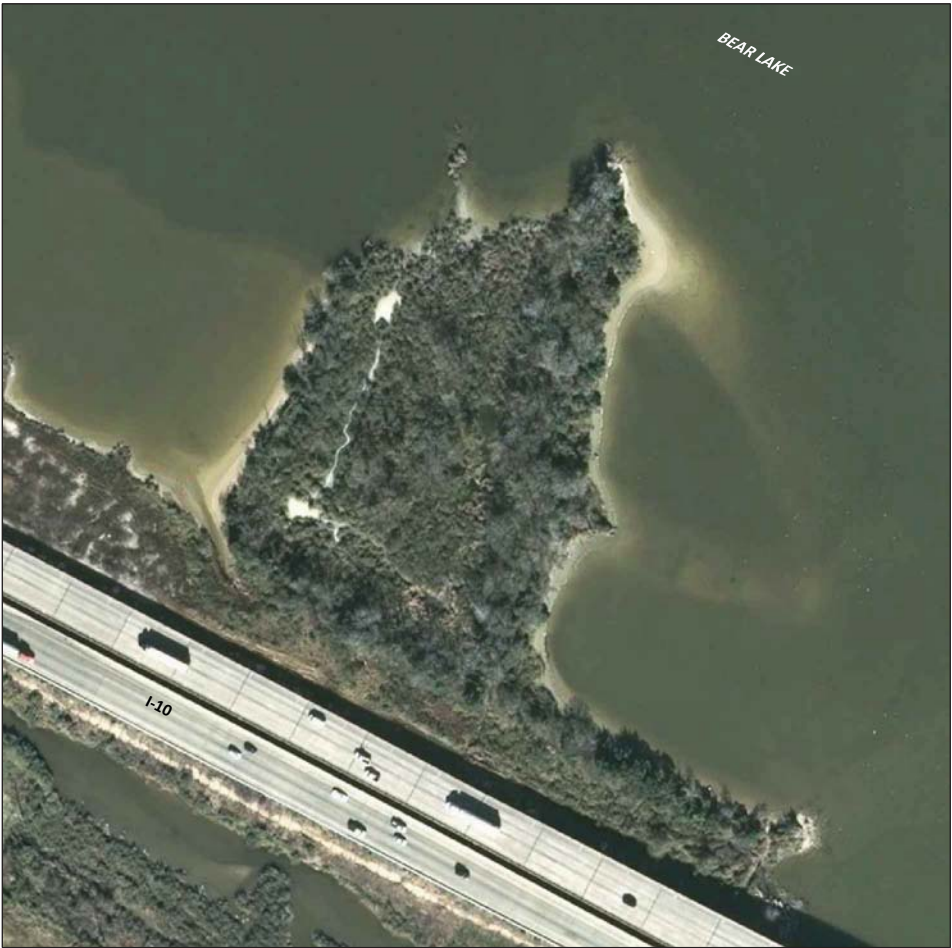
3. THE CONTRACTOR SHALL MAINTAIN SUITABLE VESSEL TRAFFIC SAFETY SIGNS, EQUIPMENT AND MANPOWER TO PROVIDE VESSEL TRAFFIC CONTROL. THE CONTRACTOR SHALL PROVIDE ALL LABOR AND EQUIPMENT NECESSARY TO MAINTAIN THE WATERWAYS FREE OF WASTE AND/OR DEBRIS RESULTING FROM PROJECT OPERATIONS.

4. OVERHEAD OR UNDERGROUND UTILITY LINES THAT MAY BE PRESENT ON OR NEAR THE PROPERTY ARE NOT SHOWN. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UTILITY LINES.

5. FOR ALL SHEETS, HORIZONTAL DATUM IS TEXAS STATE PLANE SOUTH CENTRAL ZONE, NAD 83. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88). ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

6. TOPOGRAPHY AND BATHYMETRY HAS BEEN COMPILED FROM A FEBRUARY 16, 2009 AND JUNE 12, 2010 SURVEY CONDUCTED BY HYDROGRAPHIC CONSULTANTS, LTD OF BELLAIRE, TEXAS.

SITE MAP



DRAWING INDEX

SHEET SEQUENCE	SHEET NO.	SHEET TITLE
1	T-1	COVER SHEET
2	G-1	SURVEY CONTROL PLAN
3	C-1	GEOMEMBRANE LOCATION PLAN
4	C-2	CAPPING PLAN
5	C-3	CROSS SECTIONS
6	C-4	CROSS SECTIONS
7	C-5	CROSS SECTIONS
8	C-6	CROSS SECTIONS
9	C-7	DETAILS



614 MAGNOLIA AVENUE | OCEAN SPRINGS,  
MS 39564 | (228) 818-9626

SAN JACINTO RIVER WASTE PITS  
SUPERFUND SITE

TIME CRITICAL REMOVAL ACTION

DESIGNED BY: W. MEARS / T. MERRITTS  
DRAWN BY: G. HOWELL  
CHECKED BY: T. MERRITTS  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

T-1

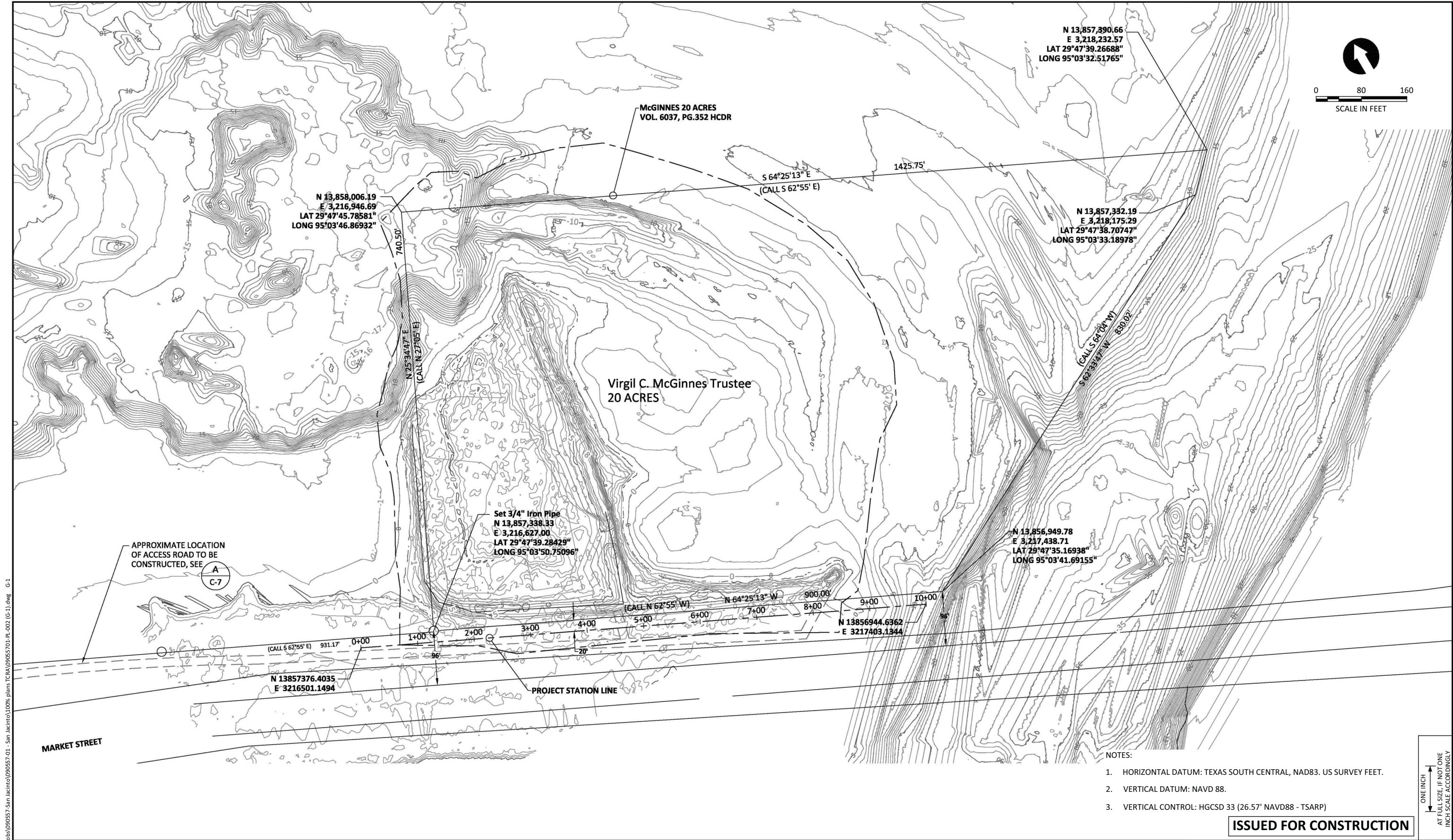
SHEET NO. 1 OF 9

JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010

ISSUED FOR CONSTRUCTION

ONE INCH  
↑  
AT FULL SIZE IF NOT ONE  
INCH SCALE ACCORDINGLY





- NOTES:
1. HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
  2. VERTICAL DATUM: NAVD 88.
  3. VERTICAL CONTROL: HGCS D 33 (26.57' NAVD88 - TSARP)

ISSUED FOR CONSTRUCTION



JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: W. MEARS/T. MERRITS  
DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

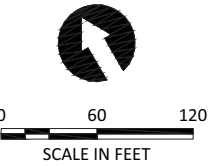
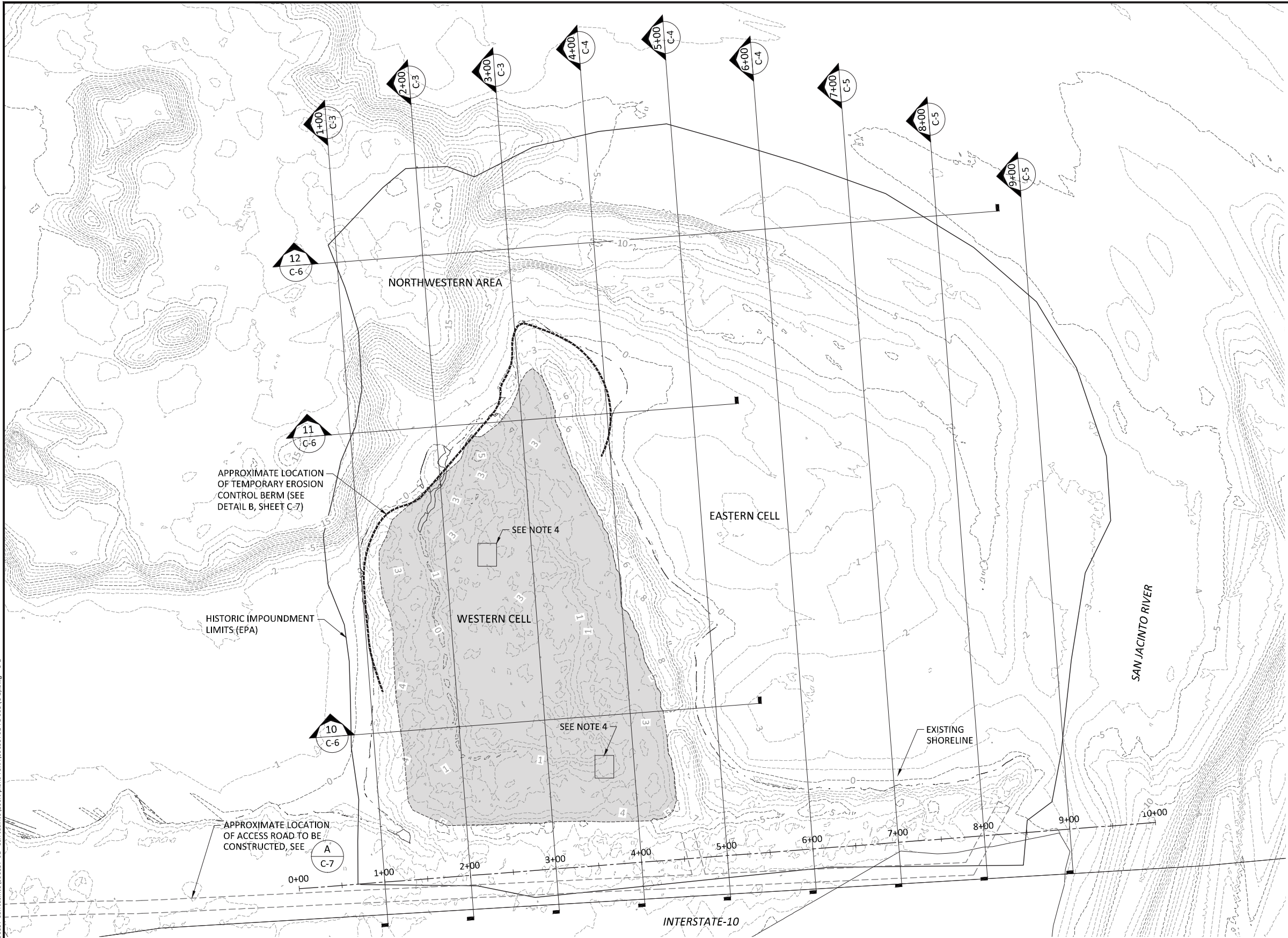
SURVEY CONTROL PLAN

G-1

SHEET NO. 2 OF 9



Aug 26, 2010 2:35 PM tgr/gja K:\Jobs\090557 San Jacinto\100% plans TCRA\09055701-PL-003 (C-1).dwg C-1



NOTES:

1. HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
2. VERTICAL DATUM: NAVD 88.
3. SECURE GEOMEMBRANE EDGE PER MANUFACTURERS RECOMMENDATIONS.
4. INSTALL GEOMEMBRANE VENTS IN 2 LOCATIONS TO BE DETERMINED IN THE FIELD. VENT DETAILS PER MANUFACTURER RECOMMENDATIONS. SUBMIT PROPOSED VENT DETAILS FOR REVIEW AND APPROVAL IN THE PROJECT WORK PLAN.

LEGEND:

- CROSS SECTION LOCATION
- EXISTING CONTOUR (1 FOOT INTERVAL)
- APPROXIMATE EXTENT OF GEOMEMBRANE LOCATION

ISSUED FOR CONSTRUCTION



JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



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REV	DATE	BY	APP'D	DESCRIPTION	

DESIGNED BY: W. MEARS/T. MERRITS  
DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

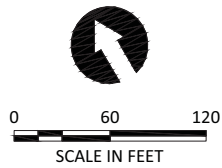
GEOMEMBRANE LOCATION PLAN

C-1

SHEET NO. 3 OF 9

ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY





- NOTES:
- 1. HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
  - 2. VERTICAL DATUM: NAVD 88.
  - 3. SEE DETAIL J ON SHEET C-7 FOR EDGE TREATMENT.

- LEGEND:
- CROSS SECTION LOCATION
  - EXISTING CONTOUR (1 FOOT INTERVAL)
  - PROPOSED CONTOUR PRIOR TO PLACING ARMORED CAP
  - ARMORED CAP A<sub>(P)</sub> RECYCLED
  - ARMORED CAP B/C<sub>(P)</sub> RECYCLED
  - ARMORED CAP C<sub>(N)</sub> NATURAL
  - ARMORED CAP D<sub>(N)</sub> NATURAL
  - ARMORED CAP D<sub>(N)</sub> (24" THICK) NATURAL

ISSUED FOR CONSTRUCTION

Aug 26, 2010 2:35 PM tgrjga K:\Jobs\090557 San Jacinto\090557 01 - San Jacinto\100% plans TCRA\09055701-PL-004 (C-2).dwg C-2



JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



REVISIONS					
REV	DATE	BY	APP'D	DESCRIPTION	

DESIGNED BY: M. HENDERSON  
DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

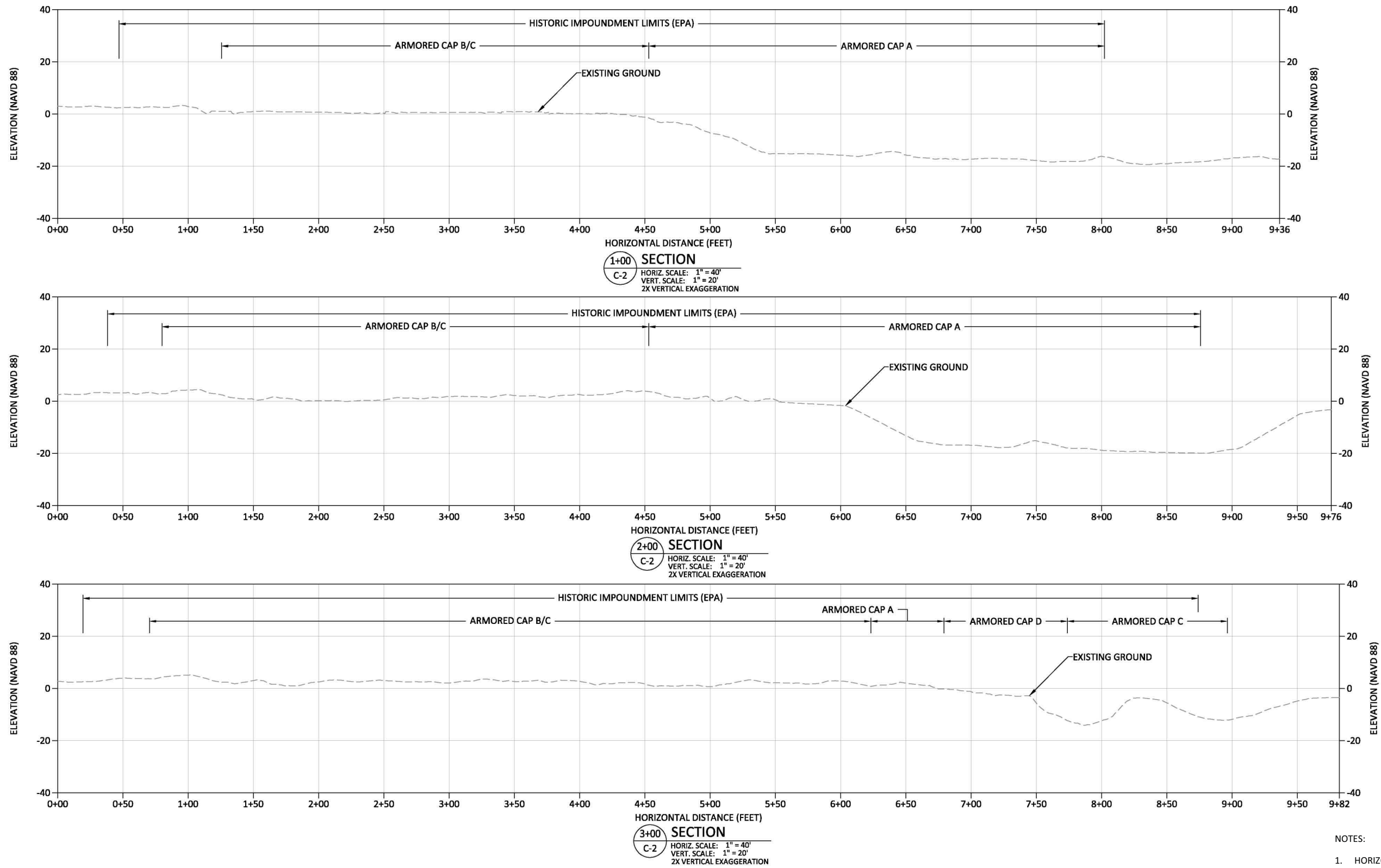
CAPPING PLAN

C-2

SHEET NO. 4 OF 9

ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY

Aug 26, 2010 2:35 PM tgriga K:\Jobs\090557 San Jacinto\100% plans TCRA\09055701-PL-005 (C-3 C-6).dwg C-3



- NOTES:
- HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
  - VERTICAL DATUM: NAVD 88.

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ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



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CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

CROSS SECTIONS

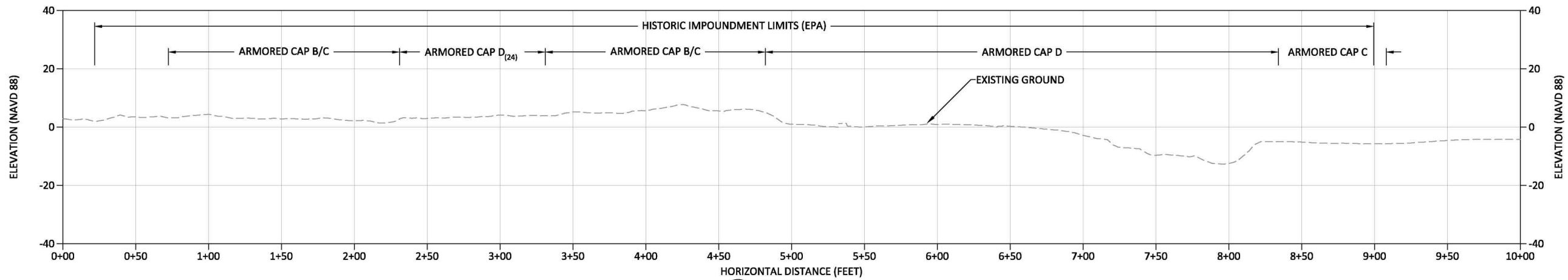
C-3

SHEET NO. 5 OF 9

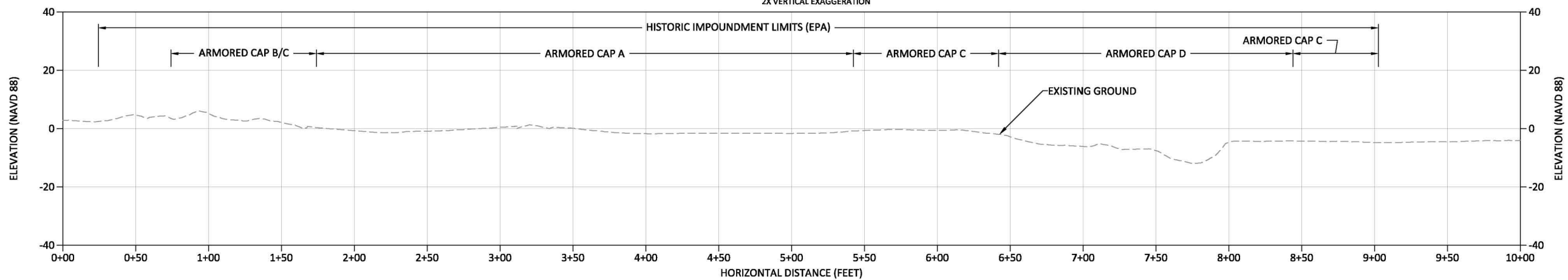
ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY



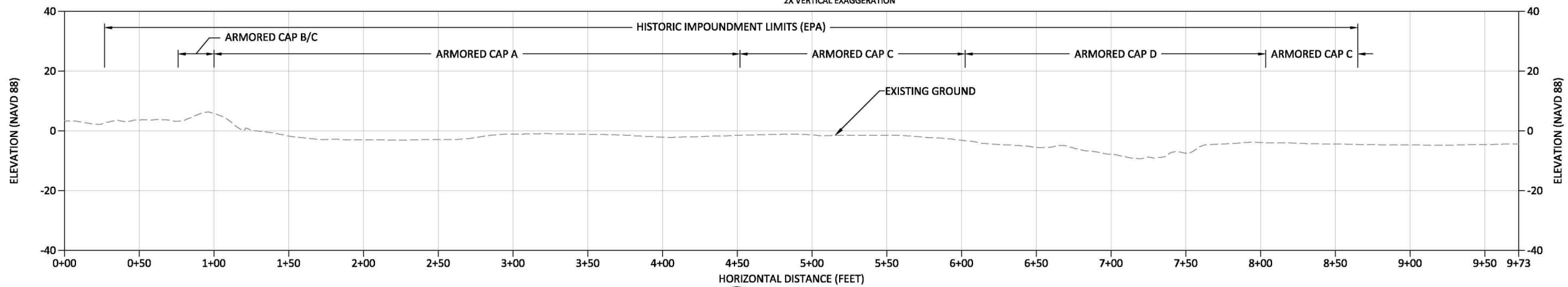
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4+00 SECTION  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION



5+00 SECTION  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION



6+00 SECTION  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION

NOTES:

1. HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
2. VERTICAL DATUM: NAVD 88.

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JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



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DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

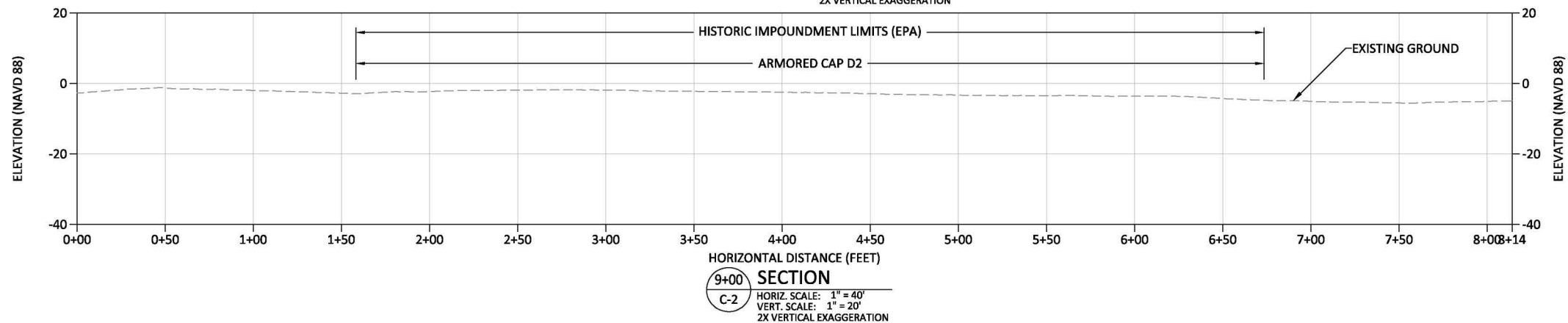
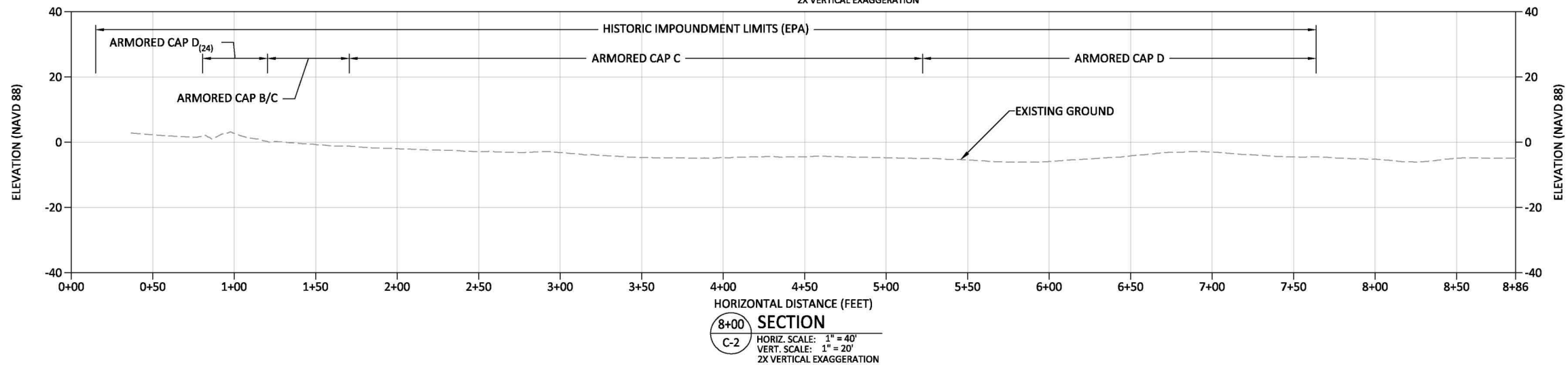
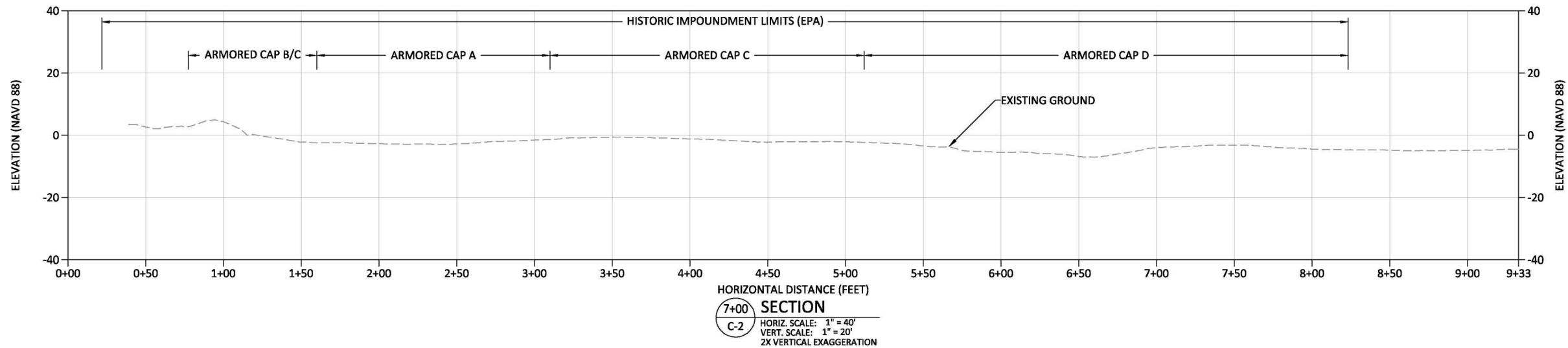
CROSS SECTIONS

C-4

SHEET NO. 6 OF 9

ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY

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NOTES:

- HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
- VERTICAL DATUM: NAVD 88.

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JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



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SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

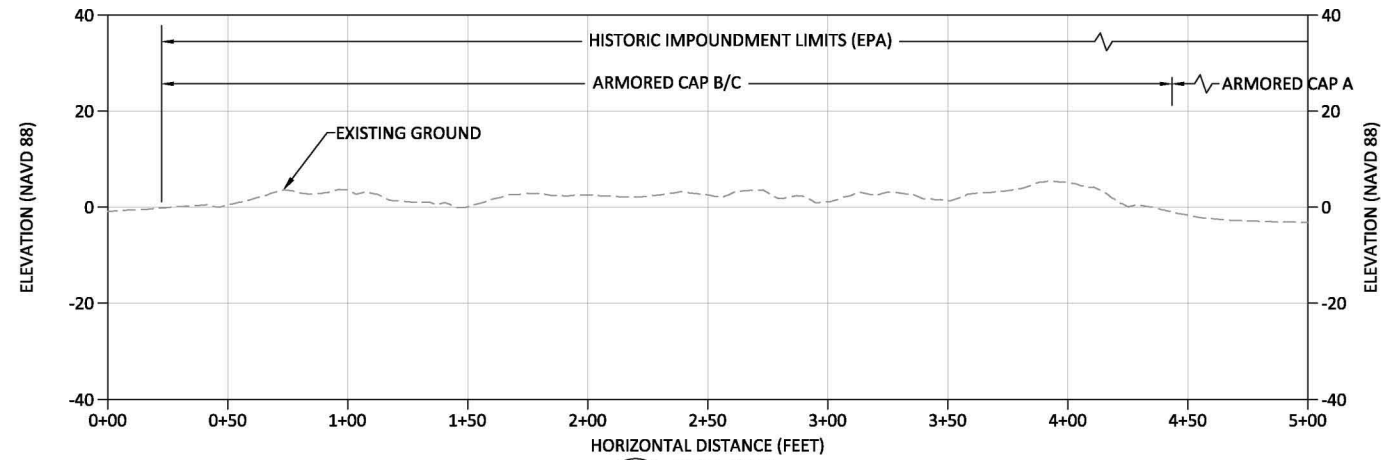
CROSS SECTIONS

C-5

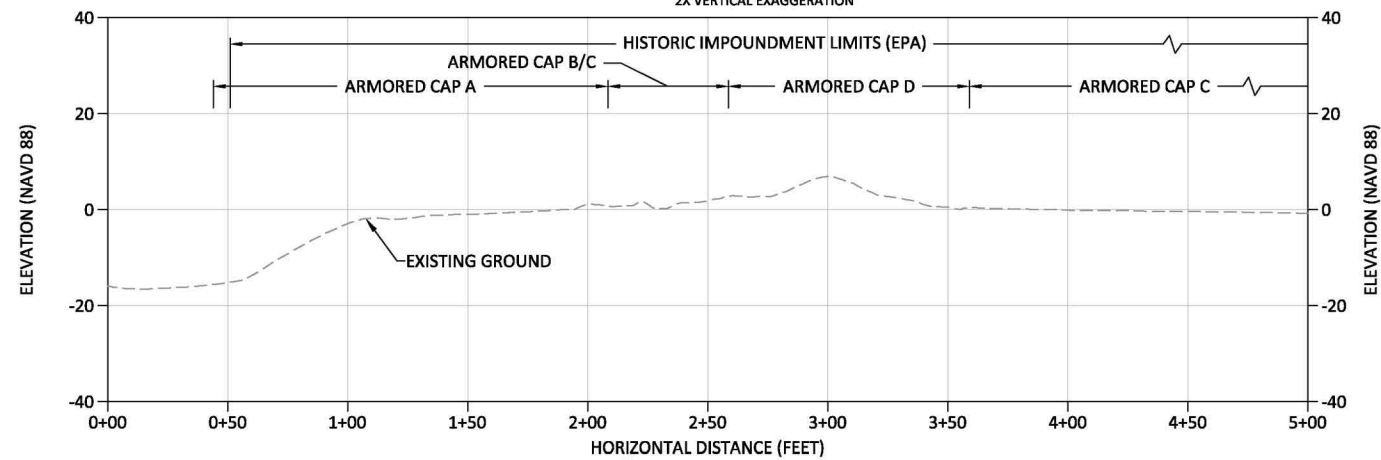
SHEET NO. 7 OF 9

ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY

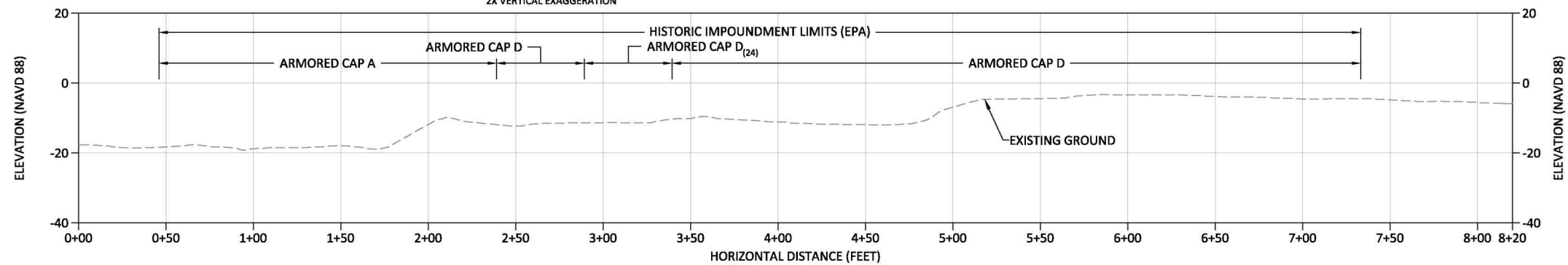
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**10 SECTION**  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION



**11 SECTION**  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION



**12 SECTION**  
C-2  
HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 20'  
2X VERTICAL EXAGGERATION

NOTES:

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- VERTICAL DATUM: NAVD 88.

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DECEMBER 23, 2010



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DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
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SCALE: AS SHOWN  
DATE: DECEMBER 2010

**SAN JACINTO RIVER WASTE PITS SUPERFUND SITE**

**CROSS SECTIONS**

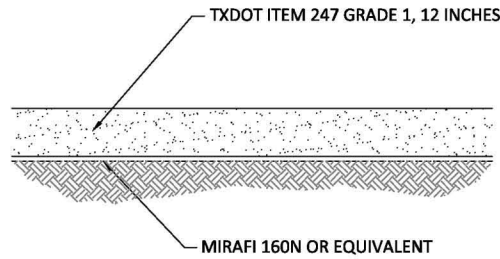
**C-6**

SHEET NO. 8 OF 9

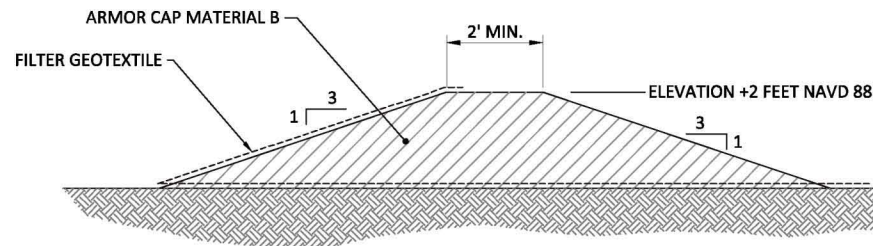
ONE INCH  
AT FULL SIZE, IF NOT ONE  
INCH SCALE ACCORDINGLY



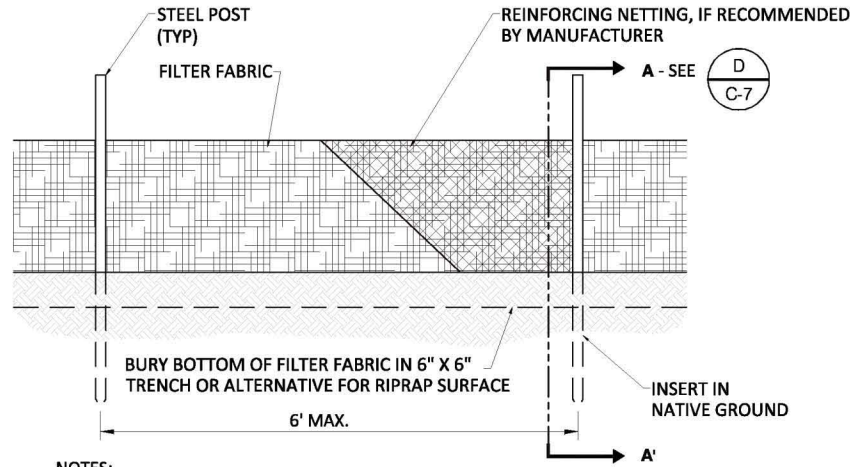
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**A ACCESS ROAD**  
C-1 SCALE: NTS



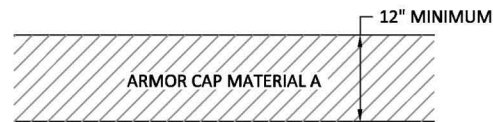
**B TEMPORARY EROSION CONTROL BERM**  
C-1 SCALE: NTS



NOTES:

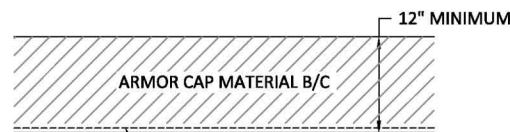
1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NON-WOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN 2, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT 2, AND BRINELL HARDNESS EXCEEDING 140.
3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
4. SPLICE JOINTS AT SUPPORT POSTS ONLY, WITH A MIN. 6 IN. OVERLAP.
5. ANGLE ENDS OF SEDIMENT FENCE UPHILL TO ASSURE SOIL/SEDIMENT IS TRAPPED.

**C SEDIMENT FENCE DETAIL - ELEVATION**  
C-1 SCALE: NTS

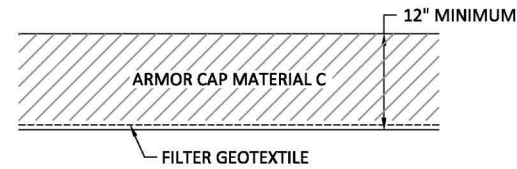


**E ARMORED CAP A**  
C-2 SCALE: NTS

NOTE:  
1. FILTER GEOTEXTILE REQUIRED BENEATH ARMORED CAP A IN THE EASTERN CELL AREA ONLY.



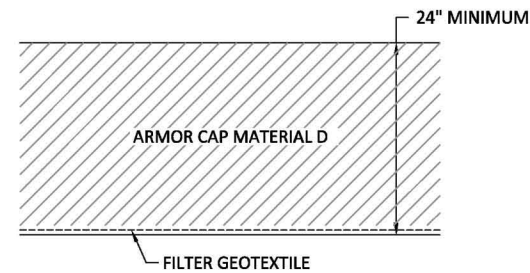
**F ARMORED CAP B/C**  
C-2 SCALE: NTS



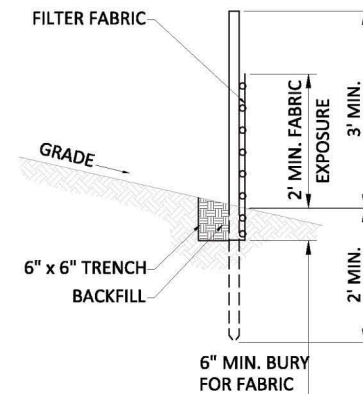
**G ARMORED CAP C**  
C-2 SCALE: NTS



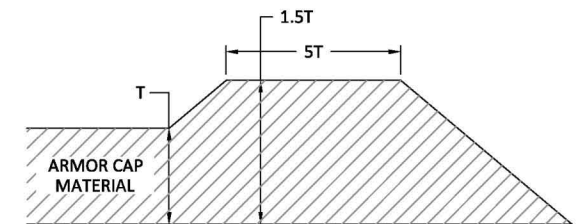
**H ARMORED CAP D**  
C-2 SCALE: NTS



**I ARMORED CAP D (24")**  
C-2 SCALE: NTS



**D SEDIMENT FENCE SECTION A-A'**  
C-1 SCALE: NTS



**J ARMORED CAP WATER EDGE DETAIL**  
C-2 SCALE: NTS

NOTES:  
1. THIS EDGE DETAIL SHALL BE APPLIED TO ALL ARMORED CAP EDGES BELOW ELEVATION 0 FEET NAVD 88.

NOTES:

1. HORIZONTAL DATUM: TEXAS SOUTH CENTRAL, NAD83. US SURVEY FEET.
2. VERTICAL DATUM: NAVD 88.

**ISSUED FOR CONSTRUCTION**



JOHN VERDUIN, PE 83802  
ANCHOR QEA, L.L.C. (F-3617)  
DECEMBER 23, 2010



REVISIONS					
REV	DATE	BY	APP'D	DESCRIPTION	
1	2/3/11	JRV	JRV	ADDED NOTE TO DETAIL E	

DESIGNED BY: W. MEARS/T. MERRITS  
DRAWN BY: G. HOWELL  
CHECKED BY: J. VERDUIN  
APPROVED BY: J. VERDUIN  
SCALE: AS SHOWN  
DATE: DECEMBER 2010

**SAN JACINTO RIVER WASTE PITS SUPERFUND SITE**

**DETAILS**

**C-7**

SHEET NO. 9 OF 9



## APPENDIX C

### CONSTRUCTION SCHEDULE

#### TIME CRITICAL REMOVAL ACTION

#### SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

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-DRAFT FINAL SCHEDULE-  
SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

